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6

TREATISE

ON

PHYSICAL EDUCATION;

SPECIALLY

ADAPTED TO YOUNG LADIES.

BY

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"Si l'on veut perfectionner l'espèce humaine, c'est dans la médecine qu'il faut en chercher les moyens."

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INTRODUCTION.

From the number of works existing on education it might be supposed that there was nothing more to be said on the subject; that is not the case,—the apparent abundance is in reality sterile, and the numerous works existing on education are but compilations and repetitions of more or less ancient date.

Until the appearance of the first edition of my work (so favourably received by the public) the subject of which I treat was new. No author had given special attention to the physical education of women; observations relating to them were occasionally to be found, but no work then existed entirely devoted to their progressive development. Yet the improvement of the human species depends greatly on woman, not only on

account of the early and attentive care she incessantly bestows on her offspring, but by her constitutional influence and the materials she furnishes to the development of the human embryo. The destiny of woman is to be a wife and mother; but she does not, like Eve, awake full grown. She has to pass through the phases of growth, the diseases incidental to childhood, and the more or less dangerous period of puberty, ere she is able to fulfil the duties of her ordination.

The natural constitution of woman seldom offers that harmony and health which may be considered as a type of strength. It is the minority, Locke very justly observed, that enjoys a strong organization and general good health; for to the anomalies of birth, already numerous, are added the evils resulting from a bad education, and from our social habits. Even maternal affection, the most noble and disinterested of human feelings, has often a fatal influence on the whole existence; particularly in the higher classes of society, where the sensibility of young girls is too fully developed, and for which the most fashionable systems of education may be compared to hot-houses.

Men of great genius have written on education; considering the art of perfecting the human species as the highest and most worthy of their meditations. Fenelon, Locke, Rousseau, have

left imperishable works; but these writers had not sufficiently studied physical organization. Fenelon in his Telemachus—worthy to be classed with the productions of Homer, wrote but for a prince, and his work was not generally applicable. Locke gave to his thoughts on the education of children too much conciseness. Rousseau made a novel of education,—the first proposition in his finely written production is a paradox, and his work is crowded with errors, that he would not have committed had he brought up his own children or directed those of others.

It is indeed to be regretted that so few medical men should have given special attention to physical education; there are, it is true, some excellent writings on early childhood, but not a single work destined to fill the space between infancy and puberty;—a few chapters only pass rapidly over those important years of life, from infancy to womanhood. "There appears but little interest," says M. Quetelet, "in the physical development of man at his different ages; hitherto the subject has not been studied; the few researches that have been made are relative, either to the period of birth, or to the period of complete development, but the intermediate age has not been considered.

Before Buffon, the degrees of growth man successively acquires from birth to puberty, had not

attracted any particular attention; and this celebrated naturalist confined himself to one single example. Since then Chaussier, Villermé, Quetelet, and a few others, have sought to determine the development of human growth; but their works, very useful no doubt, are yet too imperfect to give the mean growth of man at his different ages, particularly during the period preceding puberty.

The physical education of girls was a new subject previous to the first edition of this work. Instead of considering females as merely worthy of one chapter, I have made them the principal subject of my researches, of my observations, and my labours. To bring up a child is to place it in such a state as may best enable it to fulfil its destiny; the destiny of a young girl is to be a wife and mother:—who will say her physical education is less important than that of man?

It is a most common error not to foresee the destiny of children; yet the future is in the present, as the rose is in the bud. We admire, we surround women with our love and adoration, and we forget that health and beauty are inseparable and dependent on the physical education of childhood.

It is not generally understood how noble and arduous is the task of education;—the body, the

mind, movement, and will, must be influenced; good habits must be contracted: it is evident that, for such a task, the continual study of the human organization, and of the human mind, is indispensable.

Physical education must be considered as a preparation to life, an apprenticeship to its labours and troubles. The life of a female is more subject to trials than that of man; she must, therefore, possess at least the same power of re-action, and be enabled to overcome difficulties. More weak, more delicate, and therefore more liable to illness, the physical education of woman requires more care; and instead, of making it an accessory in a treatise on education, it must form the principal subject. Around woman should be drawn all that can shield her from the fatal influence of divers natural and moral causes.

"A good physical education," says Cabanis, "strengthens the body, may prevent disease, cures divers maladies, gives to the organs greater aptitude for the execution of the movements commanded by our wants;—hence more power and extent in the faculties of the mind, more equilibrium in the sensations;—hence more just ideas, and those elevated passions depending on habitual sentiment and the regular exercise of greater strength.

In the actual state of society, physical education is nearly always an education of chance. Whether a child belong to rich or poor parents, enlightened or blinded by parental tenderness, physical education is seldom right; and it is because there is always an accidental education, that its evil effects must be counteracted by one that is premeditated and well directed. Education should prevent evil; it is a species of vaccination, acting not only as a preservative in small-pox, but on the various diseases incidental to childhood. The object of physical education is to develop the physical qualities of woman, so that she may accomplish her noble destiny of wife and mother.

What is most sought in female education, is to encourage those talents that best tend to draw attention; and it is forgotten, that there is often more attraction in beauty of figure, and brilliancy of health, than in any accomplishment.

"We are acquainted," says Claude Ferry, "with bodily advantages, but it is thought that nature must bestow them; the art of acquiring them is totally forgotten, so that if it were not certain that the ancients had carried this art to such a high state of perfection, it might be supposed never to have existed."

The object I have in view is to establish the rules of this art, not only according to the an-

cients, but also according to the moderns. Since the first edition of this work, I have been continually engaged in preparing the one I now offer to the public; the more I have studied, and the greater my experience, the more importance do I attach to physical education. I have strenuously endeavoured to counteract the effects of a bad organization, or an accidental education, by principles resulting from a knowledge of the human organization, the study and observation of the influence of physical and moral agents, and the light afforded by science in the treatment of diseases.

I have divided my work into four parts; in the first I have treated of the general elements of education; I receive the child at its entrance into the world; I judge its chance of living, by examining the degree of strength or weakness of its organization. I observe its natural constitution, and study the matter of which it is formed. I then offer a few general considerations on life —this admirable phenomenon, that we enjoy without understanding! I shew the influence of physical agents, either for its maintenance or destruction. The study of these general elements of education appears to me indispensable, for it is principally during childhood that the natural constitution may be best judged; at a later period it is modified by education, or by the influence of physical agents. It is also during

childhood that air, light, food, exercise, and habitation, have the greatest influence on the weak organization of females.—This first part of my work is terminated by the history of Gasper Hauser, kept so many years in a state of infancy, and removed from the influence of physical agents.

In the second part of my work, I have treated of physical education in its normal state, the most important part of which is growth; and on this period depends the future welfare of children, for it is during growth that their health is consolidated or weakened, and that they improve or become deformed.

All that relates to education should be combined, so as to conduce to regularity of growth, and to remove any obstacles or malady which may arrest it. First and second teething, and accidental maladies between those two critical periods, must be well understood. Small-pox, which formerly made such ravages, has been diminished by Jenner's admirable discovery. I have devoted a chapter to vaccination, and have endeavoured to make it useful, by indicating the characters by which parents may distinguish good vaccination from false and spurious vaccination, which is not a preservative. I have treated of the means of regularly developing all the organs of motion, and have treated of gym-

nastics, carefully exposing the danger of applying the violent exercises of the Greeks, to weak delicate girls of the present age, unprepared, to bathe in the waters of the Eurotas, or to swim across it. I have attached great importance to vocal exercises, either speaking or singing. If I have maintained my opinion on stays, contained in the first edition of this work, it is not from a desire to be singular, but the result of observation. I admit that ill cut and badly made stays may injure the figure, and confine the chest, but all stays that neither impede *respiration, digestion, circulation, or movements*, cannot be prejudicial.

The study of puberty terminates the second division of the work, and it may be well to remark, that it has been my endeavour to treat this important part of my subject so as not to offend the most susceptible delicacy.

The third book treats of physical education of the anormal state. I here leave the track, beaten by so many, who have, with more or less success, written on the education of man: nearly all, and particularly Rousseau, have laid down precepts, applicable only to regular and perfect organizations; I no where find a work adapted to the physical education of children, born weak, diseased, or deformed. A chancellor of England, of our own times, whose

eloquence on the subjects of education and slavery, has been very justly admired, viewed only the least important part of the question. In his opinion, education for the poor seems but to consist in their being taught to read and write. How much better would his eloquence have been applied, had he employed it in favour of physical education of children who perish in manufactories or workhouses! These white children, of European blood, are surely as worthy of the sympathy of a great orator, as children from the African soil!

The physical education of the anormal state is still a new subject. In order to ascertain the means of bringing it to common rule, the primitive constitution must be known, the diathesis, which predispose children to convulsions, scrofula, or consumption, must be well understood. What I relate, as to this diathesis, is of the highest importance; while the bills of mortality shew, that convulsions and consumption carry off a third of the population in large towns.

How many mothers deplore the loss of young children, suddenly torn from them, when physical care might have preserved these objects of parental affection! How many boys and girls are victims to consumption, while their parents indulged the hope that all danger was passed!—It is not when consumption is in an advanced

state, that it suffices to treat it; the only cure is prevention,—for which purpose, the predisposition must be foreseen. When consumption, scrofula, or madness, are hereditary in a family, the children can only be saved by changing the natural constitution affected by an original stain, which constitutes diathesis.

Studied during childhood, these diathesis are easily distinguished; at a more advanced period, they are only manifest during the crisis of growth or in the diseases common to this epoch, when they have not been modified by education. But, these diathesis do not always appear in a decided manner, they are sometimes manifested by other diseases, deformities, or partial deviations of the limbs, spine, or chest.

I give so much importance to the extension of the chest, and development of the lungs, that in the course of this work I often return to the subject. I cite examples of the success obtained by men of note, who were considered as predisposed to pulmary phthisis, and who, by means of proper exercise, and being placed in suitable conditions, have reached an advanced age. I am of opinion that there is no cure for consumption, when it is in an advanced stage, and that there is softening of the tubercles; but I think the great art of the physician, in physical education, is to prevent the evil, and to arrest the

progress of the tubercles. I have my own peculiar views on this subject, having had many opportunities of judging this malady; and if my professional pursuits admit of it, I shall place my notes in order, and lay them before the public.

The deviations from the normal state of the spine, are sometimes constitutional, at other times only the effects of attitudes and bad habits. It is most important for parents and governesses, to see the deviation in its origin. I have been careful to enumerate the symptoms, by the aid of which parents might arrest the future progress of the evil, by curing it in the commencement. In all cases science affords ample means for treating these different states. Among so many systems, enthusiastically lauded, it was necessary to make a choice, and I have thus been brought to examine the divers orthopedic means, and to give my opinion on the most advantageous and inoffensive measures. As I am in the habit of treating these diseases and deformities, an impartial account of the actual state of science will be found in this work.

Stammering is also a deformity that physical education may prevent and cure; I have made known the best methods of so doing. The blind and dumb, being peculiarly situated, demand a special education;—all Europe justly lauded the discovery made by the Abbé de Lépée, and

that of Mr. Hauy. The education of the deaf and dumb, is a step to that of some individuals, who have been wrongly considered as incapable of improvement, and unworthy of education. This subject terminates the third book.

The fourth book is devoted to the physical and cerebral education of weak minded children, or idiots. I here claim the merit, however trifling it may be, of having opened a new path for the education of these imperfect beings. I do not imitate Dr. Voisin, and seek to discuss or ascertain the greater or lesser degree of criminality that may be attributed to their unreasonable actions; it is not the moral question I desire to solve, but I wish to effect for these unhappy and ill-organized beings what has been effected for the blind, and deaf and dumb. I establish, as a principle, *that while an individual is accessible to any sensation, he is susceptible of education.*

The education, it is true, must be appropriated to the particular state of the imbecile or idiot. I have examined the value of the craniologic system, and have done so with independence, regardless of prevailing opinion, for my views are founded on facts. I do not say that Gall's system is wholly false, but I decidedly think it cannot be universally applied; it is only an element, that may help to shew the intellec-

tual state of the individual: and I do not admit the possibility of judging man's strength of mind, or degree of intelligence, by the size and the external shape of the head, without the aid of other means. I should prefer judging the intellect from its produce. I form my opinion of the talents of an individual by their results; at the same time, I admit the influence of material organization on the mind—but merely, according to the expression of Condorcet, as opposing obstacles to its activity, or as giving the power of employing it with more constancy and liberty.

The disciples of Gall endeavour to shew, that the absence of the function corresponds with the absence or weakness of part of the brain, but they have gone no further.—This fact being admitted in an absolute manner, the function could never be acquired,—a conviction that would indeed be painful, and but little fertile. Were there no further progress, it must result, that the blind would never make up for their want of sight, and the deaf and dumb would be unfit to receive any species of education; yet we have proofs to the contrary. The imbecile and idiot are seldom completely deprived of any sense; why not, therefore, seek to give activity even to the function of the imperfect sense remaining? It is certain that the blind read by

means of the fingers; it is also true, that the deaf hear by means of the vibrations of sonorous agents that are within their reach. Is the imbecile always beneath the blind, and the deaf and dumb? I should think not; but what has hitherto been done to give activity to their senses, and to make up for those that are wanting? I have rapidly shewn what might be expected from music, gymnastic, the language of signs, and prepared scenes, or lessons in action, to be given to imbeciles, and to idiots. Imitation is a faculty common both to them, and to children. Imbeciles and idiots are mostly but children stopped in their mental progression. I regret to say, that the part of my work relating to this important subject, is but a sketch; my avocations as a medical man, and the constant calls to which I am subjected, would not allow of my enlarging it at the present moment. I am quite resigned to dispense with any literary palm, if what I offer new to the public prove useful; and if others, beginning where I have terminated, give to the subject a higher degree of interest. The work concludes by a chapter treating of the influence of the mind on the body.

This treatise may, perhaps, be thought to contain too many technical terms for general readers, which may be excused, as emanating from the pen of a physician.

This modest edifice, dedicated to mothers, has been erected on the neutral territory of science. All nations have, more or less, contributed to it; England, by Locke and Jenner; France, by l'Abbé de Lépée and Itard; Switzerland, by Rousseau and Salzmann; Germany, by Gall; America, by Mrs. Leigh, and Spurzheim. I regret I have not space to name all the authors, in whose different writings may be found even some few pages, on physical education; but no work, until the present, was devoted entirely to the physical education of girls. As destined to become wives and mothers, it has been my anxious desire to preserve them, from infancy to womanhood, from diseases and deformities, and to enable them to accomplish the high and important part the divine Creator has allotted to them, as depositories of future generations.

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TREATISE

ON

PHYSICAL EDUCATION.

BOOK THE FIRST

GENERAL ELEMENTS OF PHYSICAL EDUCATION.

CHAP. 1.

Importance of Physical Education.

LOCKE, in his Work on Education, has admirably commented upon the well known line of Juvenal, "*Mens Sana in Corpore Sano.*" "A sound mind, in a sound body, is indeed a short but full description of a happy state in this world; he that has these two, has little more to wish for; and he that wants either of them, is but little the better for any thing else: men's happiness or misery is for the most part of their own making."

Legislative philosophers, anxious for the welfare of future generations, have endeavoured to lay the foundations of happiness, at the earliest possible period. In former times as soon as

children were born, statesmen considered what could best tend to make robust and useful citizens. The Spartans watched most zealously over the destiny of the human species, and Lacedemonia produced the ablest, the bravest warriors; soldiers inured from childhood to the fatigues and trials of life. The more we look back to antiquity, the more we study the ancients, the more we look to nature—the more healthy and robust is the organization.

What a splendid code of laws is to be found among the ancients, in the pentateuch; in the Cyropedia, where Xenophon refers to the early days of Cyrus; among the Romans, during the three first centuries of their wars; and among the Gauls, the Germans, the Saxons, the Normans. This species of education, purely corporal, was well adapted for times of struggles and wars; but physical education became of secondary importance, when the resources and newly created wants of a civilization, essentially intellectual, gave the mastery to thought over matter, and intelligence over strength. The greater the advances to civilization, the greater the sweets of life, and the refinement of manners; physical strength is less necessary, since the introduction of mechanics and various agents unknown to our ancestors. Riches no longer merely consist in the productions of the soil; the gifts of industry and intelligence are duly appreciated, but as we deviate from the simple

and primitive mode of life of our forefathers, and of our peasantry, we find our physical constitution weakened and deteriorated. Is it then surprising that in large cities where corruption, effeminacy, misery and vice predominate, the human species should degenerate; and that men of the present age should but little resemble the heroes of Homer? Human power formerly so circumscribed, appears in the present age almost unbounded, and the elements which the savages and the ignorant adored, are now mastered by civilized man

While *intellectual value* holds the highest rank, brings into action all physical strength, increases the means of enjoyment, and happiness of society, and attracts general attention, intellectual education must have an exclusive preference. Yet Montaigne wisely observes that education should not be incomplete; man must not be separated in two parts; the whole ought to be educated together; therefore however great may have been the progress of civilization, however pre-eminent intellectual education, of what avail is it without health? Of what utility is a weak and sickly individual to whom life is a burthen? As long as civilization and knowledge do not enable man to dispense with walking, seeing, breathing, hearing, speaking; while it is necessary, to have sound lungs, a well developed brain; muscles and bones sufficiently strong to support the body and limbs; and a voice to communicate the

ideas; the assistance of physical education will be found requisite to ensure these invaluable blessings. A sound mind in a sound body is therefore the great object; the one is dependent on the other; they are either mutually strengthened or mutually weakened. The mind and body are inseparable companions; and while the breath of life animates our frame; while an immortal soul vivifies our organs; mind and matter must be equally developed, and afford each other aid. Can the muscles be subservient to the will, unless they have sufficient strength to support the bones they put in motion? and would not intellect be imprisoned in a feeble body? Man, in full possession of all his mental and physical strength, is a most admirable phenomenon: consider his noble and erect attitude; his head turned towards Heaven; his eyes beaming with a sacred fire; his firm and steady gait; his fine open chest, where the heart beats freely, where the lungs expand without effort.

How graceful and lovely a creature is woman when in the enjoyment of health! What harmony and regularity in her shape! What a beautiful combination of delicacy and strength! How sublime the union of intellect and physical beauty!

> Two of far nobler shape, erect and tall.
> Godlike erect.
> For contemplation he, and valor formed;
> For softness she, and sweet attractive grace.

In debilitated children of an unsound constitution, the chest is confined, the heart beats irregularly, and the respiration is imperfect; the spine can scarcely support the weight of the head and body; an habitual stoop takes away all grace. While the physical organization degenerates, the precociousness of intellect is more manifest, creates considerable uneasiness; parents tremble for the fate of their offspring, for it seems as though the mind despised the imperfect corporeal matter, and was impatient to escape from so frail a tenement.

A great error to which most people who have the charge of children are liable, is to suppose that the gymnastics of the Grecians are universally applicable. Human beings are not merely composed of muscles; it is not only the organs submissive to the will, that require to be educated. Muscular gymnastic, it is true, was well adapted for the greeks who were more agricultural and warlike, than industrious and intellectual.

The climate of Greece and Italy was favorable to the growth of human plants; the rays of the sun were conducive to their culture; the functions of the skin were not languid, the chest was not confined; living in the open air was advantageous to the growth of children; and it is not therefore surprising that Greece and Rome, gave such beautiful models to sculptors and painters.

But would it be judicious to educate children

in cold climates as though they were natives of Sparta? Is the same clothing equally adapted for summer and winter? Nature has covered the animals of the colder regions with warm furs, and is not this a refutation of the theories of short sighted philosophers?

The physical education of the present age cannot be similar to that of the Greeks and Romans; climate, manners, progress of civilization, the different situations in life, luxury, misery, have a direct or indirect influence on the infant constitution of both sexes. The brain must be physically educated: this species of gymnastic was unknown to the Greeks; it is carried to an excess in the present age, and requires to be modified and regulated.

In the time of Lycurgus, education was an easy task; every thing tended to give vigorous citizens to the republic; there were no precocious marriages; children were not suffered to perpetuate families till their own bodies had attained full maturity. If, notwithstanding these precautions, a newly born infant, was either weak, or ill-shaped, it was judged unfit to live, and was barbarously sacrificed. In Sparta, muscular development was highly prized, and the means of attaining it were facilitated. Phidias selected models for his Minervas among the Spartans. But in Athens, where the effeminate education was somewhat similar to that of the present day; where no child was massacred

at its entrance into life, if it seemed unhealthy; where the daughters of the first families of the state were brought up with more refinement than judgment; mothers exhorted their children to be virtuous, but they urged them still more to be graceful; to hold themselves upright, put back their shoulders, to tighten their waists, to be very abstemious, lest too great a degree of *embonpoint* should spoil their figures, and render them awkward; physical education was therefore, wanting in Greece. But let us not look to the ancients for models; let our children's education be adapted to the present times; suited to our habits, our manners. All infants do not enter the world strong and healthy; many suffer previously to birth. The great object of education should be to fortify weak organizations; religion, reason, philanthrophy, call on us to strengthen the debilitated child, foretel its wants, and cure its growing infirmities; for what babe, however feeble, is not its parents greatest treasure? But what inconsistency! Philosophers, and other learned men, have strenuously sought to improve the race of dumb animals; they have given an equal degree of attention to the culture of plants: fruits and flowers, have been transplanted and grafted; yet man is left in total neglect, as though he were unworthy of notice; and that it was of greater importance to have fine pine apples, beautiful camelias, than strong and healthy human beings.

According to our acceptation, of physical education, it is not confined to strengthening the muscles, but to the regular and harmonious development of all the organs; to establish good fundamental qualities, as the basis of health and happiness.

It is not any given number of organs that we seek to make perfect; it is not to fill any particular station in life that we wish to qualify individuals, and make them attain the nearest degree of perfection: but, whether in adversity or prosperity, we desire that the physical education given to our children should prove a protecting shield; we would not have it merely confined to those regular organizations, requiring but little care, and who are naturally well developed; but still more to those whose irregular and weak constitutions, demand all the assistance of art and maternal love to supply the deficiencies of nature. To children pitied by society, condemned by the vulgar, beloved only by their parents, well directed physical education is particularly adapted. For deformities of the brain, the chest, the spine, the organs of the senses, are reserved the gifts of physical education, guided by rational physiology.

What we establish here, is not theory, but scientific practice, resulting from observing human infirmities, from palaces to the unwholesome and miserable abode of the poor. Physical education would not be undervalued, if the victims to that

fatal malady, consumption, were numbered.

Nature, in the orginal constitution, gives the primitive elements of all education: it is then the province of the physician to appropriate the physical agents of life so as to cultivate the good seeds, and eradicate those that are contrary to a normal and regular development. Medical men may strive to counteract the effects, and the different circumstances which may have influenced the unborn child; yet mothers, nurses, ought to be aware of the watchful care infants require; it may therefore be justly said, that education commences with life from the cradle. Let us then surround the new born babe, whose first cries are so pleasing to a mother's ear; let us assist at the struggle about to take place between this weak being, and the immense world into which it has just entered: and before we study the laws of life, and its admirable phenomenon, let us imitate the potter, who prepares the earth before he moulds it: let us listen to the infant's earliest sigh, and endeavour to judge of what material it is formed; and as the happiness and misery of children do not really depend on themselves, we will strive to prepare for them the inestimable treasure of health, and free them, as much as is in our power, from bodily pain.

CHAP. II.

Infancy.

THE barbarous custom respecting children, which existed at Sparta, is universally known. Immediately after the birth of a child, says Plutarch, it was taken from its mother and carried to a place called *Lesche*, where the heads of the family then assembled, and the infant was examined. If well formed, robust, and all its limbs properly shaped, it was to be brought up, and one of the nine thousandth parts of the inheritance were allotted for this purpose; but if the child was deformed, ugly, and feeble, it was thrown into a place vulgarly called apothetis, as it was considered expedient, both for the good of the child and the public, that it should not live, unless likely to become a vigorous and useful subject.

Had this custom still prevailed, the world must have been deprived of some of its brightest geniuses; for would not Pope and Byron have been cast into the apothetis?

The ancients placed the highest value on physical strength, which accounts for the care they took in their choice of infants: the less civilization has advanced, the greater the value placed on muscular power. In civilized nations intelligence has dominion, and the power of civi-

lization is in the mind; strength is not what is most requisite.

It is strange that those men who for some natural defect might have been cast into the apothetes, by the Lacedemonians, are very often endowed with great mental powers. Poets, painters, historians, philosophers, statesmen, are less remarkable for the beauty of their physical organization, than for the admirable productions of their genius; but warriors were necessary to the existence of Sparta; and the Spartans took little share in the great work of civilization, and in the mental perfection of society. While we look with horror at the barbarous customs of Sparta, let us endeavour to give useful subjects to the state. To accomplish our purpose we must form a kind of tribunal around the infants' cradle; not to condemn it to destruction, but to develop and perfect that organization, which at its entrance into life is but imperfectly sketched.

It is not easy to determine what may be called infantine weakness. Children who come into the world with low cries, difficult respiration; who cannot retain their food, and seem at every instant ready to breathe their last, may indeed, with justice, be considered feeble; but should there merely be a comparative disproportion between the organs; if for instance, the head be more than usually developed, that constitutes deformity, not weakness. Napoleon, in his childhood, had a large head, slim body, and small legs.

When children are born with well proportioned organs, breathe freely, digest their food, and have strong voices, they may be thin and small, but though apparently weak, experience proves that they thrive, and grow up strong and healthy: but if there be any defect in the organs essential to life, whatever may be the infant's appearance, it is in reality feeble, and cannot be expected to live. Any disease of the brain, the chest or the intestines places the life of a child in imminent danger; some anatomists have called these organs the trevit of life.

The brain and the nerves are subject to frequent anomalies, but all do not cause dissolution; particularly, if there be only a small portion of brain wanting, and its development has not been widely arrested; different degrees of deformity then ensue: some children have a very small skull, narrow forehead, and are more like brute than man; yet they live, or we should rather say, vegetate; their intellectual faculties do not improve; they remain idiots all their lives, unless a proper physical education be adapted to their imperfect organization. Most phrenologists have models of this description among their collections. The absence of any part of the brain often causes death. Hydrocephalus is only fatal under certain circumstances; but individuals afflicted with these diseases, seldom live long.

Children's skulls are generally deformed immediately after birth; if left to nature they re-

cover their shape; ignorant nurses sometimes strive to mould them, and their injudicious attempts may be attended with fatal results.

Free respiration in new-born children, is of vital importance; the principal phenomena which take place in the transition from interior or intra-uterine, to independent life, are observed in the organs of respiration. When an infant has breathed, it has lived; air is the spring or source of life; and whatever prevents children breathing, prevents them also from living: thus narrowness of the chest, defective formation, extreme weakness opposing the free exercise of the lungs, are sufficient to arrest the course of life.

Between the lungs and the heart there is so direct a relation, that disorder in the one, produces disorder in the other; any great anomaly of the organs of circulation may be followed by death, notwithstanding the many resources afforded by nature in the numerous vessels of the system.

When the heart and lungs are filled with blood, a sufficient quantity of air cannot penetrate; the child seems to slumber, languishes a few hours, then droops and dies.

Nearly all intestinal lesions prove fatal; sansanguine congestions, internal hemorrhage, inflammation and ulceration, are serious maladies, though not always mortal.

These are the principal causes of weakness in infants. Had the Spartans taken time to

consider these circumstances, they would perhaps have been less barbarous; but deformity was punished with death; and even philosophy can find no excuse for laws so opposed to all feelings of humanity; but the Lacedemonians dealt largely in the horrible crimes, for which antiquity stigmatized Procustes.

When a child is born with a wrinkled face, small limbs, hollow eyes, and has an aged countenance, it seldom lives long; but appearances are so deceptive that it would be impossible to lay down any general rule, as infants apparently strong, sometimes expire a few days after their birth.

Practitioners generally form their opinion of children's chance of living by the signs here mentioned, viz. full development of the organs of the chest and lungs; this latter circumstance is most appreciated, and slave merchants value the wretched creatures they purchase by this criterion. In Asia, a wide chest is considered beautiful, and we may conclude that this opinion was common in Greece, if we judge from the statue of their Apollo, which could never have been copied from a consumptive individual.

Let us now suppose a child be thought fit to live, and part of the common inheritance allotted to him; may not the deformities that would have caused him to be condemned to the apothetes take place at a later period? How many dangers are attendant on the first teething;

what unceasing care, and numerous precautions are necessary to bring up young children. It does not suffice merely to say infants may live; pains must be taken to avert the many evils that surround their cradle. If, as at Lacedemon, only strong children were to be brought up, physical education might be almost regular, and general, and suited to all young persons; but in our social state every human being is entitled to the enjoyment of existence, and it is the duty both of parents and society, to grant them protection; and the philanthropist must lay down rules, not only suited to children of strong and vigorous constitutions, but to those whose delicate health require a still greater portion of judicious attention; the first study in physical education, is therefore undoubtedly, man's natural constitution, the constitution he inherits from his parents, and with which he is born, and retains during childhood; this knowledge is the first principle of education, the foundation of every edifice; for all the benefits of well directed physical education, all the advantages of science and reason, are invariably grafted on the human organization.

CHAP. III.

Constitutions.

MAN is enclosed in the infant, as the flower is contained in the bud, and even in the seed itself; and as the future blossoming and bearing fruit are but the expansion of the seed, so manhood is but the development of infancy. Hippocrates made this observation, and compared men to plants. All the elements of health and physical beauty are united in infancy. If a child be born with a sound constitution, he grows up vigorous, and easily surmounts the many attacks to which children are exposed; but if he has naturally a feeble and sickly organization, he wastes away, and seems unable to bear the effects of the surrounding physical agents.

Constitutions may be divided into two categories, strong and weak, though it be difficult precisely to define them; for the words strong and weak are too generally used to be well applied as qualifications of constitutions.

If we trace the sources of life, we shall find man formed of two primitive elements, which seem to contain all the materials of organization in subjection: these elements are nervous matter, and blood; and all constitutions may be classed under these heads, sanguine, and nervous constitutions: numerous varieties proceed from these

two great divisions, and bear the name of temperament. The infantine constitution when left to nature, continues the same through life: thus in lusty persons predominance of sanguine fluids; in thin persons, predominance of nervous fluids; and the most enlightened care is necessary to effect any change in a constitution naturally unhealthy.

Childhood is the proper time to improve, and purify a vitiated constitution; the human body may be compared to the cells of a beehive, intended to contain nourishment and physical agents: the body receives all the materials deposited in the cells of its tissues, and these materials, according to their different qualities, will either strengthen or weaken the organization, and assist or prevent its development.

The blood is the life of the flesh; if the blood possess all its normal properties, the organs expand, the face is animated, the muscles are powerful, the whole body is in full strength and beauty; while, if the blood be poor, containing more aqueous fluids than in its natural state, a lymphatic predominance exists; weakness ensues, accompanied by great paleness, and a sort of atony, which demonstrate the insufficiency of nutritive materials for the general development of the whole body.

If the heart and the circulating blood vessels are in full activity, says Richerand, the complexion is florid, the countenance animated, the

body well shaped. The qualities of the mind are not less striking: persons of a sanguine constitution have a brilliant imagination, retentive memory, and quickness of conception, seldom disturbed by illness.

But when the blood is aqueous, the circulation irregular, the palpitation of the heart unusually quick, the functions are *slow* in their action, the face is pale, the eyes sunken, the legs are weak, the constitution lymphatic. Young persons thus affected are averse to exercise, and fall into a state of melancholy, which may bring them to an untimely end.

Children born with a sanguine constitution grow up well; while, on the contrary, those with a lymphatic constitution, are not easily reared.

Nervous constitutions are also subjected to modifications, having a decided action on the feelings, passions, and intellectual faculties of individuals. This constitution is often the privilege of true-born genius; but the precious gift is too frequently counterbalanced by a fatal predisposition to cerebral diseases and nervous affections. How much care and attention are requisite not to shake these *sensitive* organizations, when the slightest revolution may bring on convulsions and cause sudden death!

The most essential point, therefore is, to become acquainted with children's constitutions; this knowledge is the basis of physical education. That either all intellects, or constitutions, can be

brought to a level, is a paradox contradicted by mere observation. Common physical education is only calculated for organizations without any striking predominance; the same as public intellectual education is only suited to ordinary minds, which, according to Gall, are indifferent to surrounding objects, and leave every thing unnoticed. For these sort of individuals, deficient in taste, wanting feeling, and shewing no decided inclination for any particular undertaking, general instructions may be well adapted.

Let due importance be given to the constitution, as a foundation for the edifice. It is the primitive matter which should be carefully preserved, if healthy; if not, it must be purified in early life. We shall now proceed to consider constitutions under two separate heads, hereditary and acquired.

CHAP. IV.

Hereditary Constitutions.

Some authors have denied the existence of hereditary constitutions, and yet believed in predispositions. It is by no means our intention to make any comment on so striking a contradiction; we shall merely observe, that we agree with the majority of scientific men in thinking that daily observation leaves no doubt as to the fact of hereditary diseases.

If the laws of nature be always regular; if a child resemble its parents in features and disposition; if the same race of men be preserved through whole generations, when no accidental causes chance to degenerate it; why should not the paternal or maternal constitution be transmitted, whether it be sound or not.

The Bramins, says Alp Leroy, in point of goodness, beauty, and intellect, are far superior to all other Indians; and they form alliances in every cast likely to improve their posterity. What can be more striking than the Jewish countenance, transmitted from generation to generation. Notwithstanding the vicissitudes to which the Jews have been subjected, neither their language nor customs have undergone any

change. Among the Romans some families were called *Nasones, Labeones*, owing to certain hereditary affections.

The shape, size, and *general* resemblance, are undoubtedly hereditary, says Récamier; why, therefore, should not particular likenesses be hereditary, which is the case in certain families. Cullen, in his Practical Medicine, quotes an example of the father of a family who had the king's evil; all the children who bore resemblance to him, were also affected with it, while those like the mother, were perfectly healthy.

Experience and analogy, according to Baudelocque, concur to prove the predisposition to scrofula to be hereditary; but does this hereditary predisposition inevitably bring on the disease? We by no means think so; its development, must be the consequence of some particular action uniting with the predisposition; and this amounts to saying, that a foreign agent is necessary to the development of scrofula. Thus hereditary diseases exist, and the maladies transmitted, appear when the constitution undergoes some accidental shock; and they are on the contrary, modified by judicious and enlightened medical treatment.

What is the predisposition to certain affections? Is it not a particular state of the constitution; a sort of diathesis? And what is a diathesis? Those who do not acknowledge hereditary constitutions,

or a natural transmission of a healthy or unhealthy state, similar to what takes place in vegetables and animals, nevertheless admit a predisposition, which is in short but another name for hereditary diseases. Some authors state, that to believe in the inheritance of certain diseases, is the act of a fatalist; as if establishing a fact, was to render its occurrence absolute.

We maintain that there are hereditary maladies, and we are of opinion that they may be considered as the continuation of diseases of the parents, who during the time of their conception were labouring under disease, and have not had proper medical treatment, if indeed they have had any. We are not fatalists in acknowledging hereditary constitution. A disease of long standing, may for a time baffle the resources of art; but, if properly attended, while the patient is able to bear medical treatment, particularly before growth be completed, there is every chance of success; but if man has reached the age of fifty, at which period of life the body undergoes but little change, it is then too late to modify the constitution, for no new elements can be introduced into the economy, as it is unable to endure the powerful stimulus of medical agents.

CHAP. V.

Acquired Constitutions.

ALL causes which influence the native constitution, may either deteriorate or improve it; there are consequently acquired constitutions, and all the resources of art must be employed to counteract any alteration from the normal state. Diseases which become chronic, and so inherent, that there is no chance of a radical cure, may be termed new elements, forming an inseparable connexion with the body. This possibility of acquired constitutions may be observed in all individuals subject to the power of morbid agents; thus lymphatic, scrofulous, nervous, tuberculous constitutions may exist, through the influence of either internal or external causes, without any particular predisposition.

Robust individuals, with sanguine constitutions, and great muscular power, go to prison in full health, and when liberated, are weak, haggard, and suffering from glandular swellings; others injured by the irritation attendant on their profession, become consumptive.

The experiment made by an English Physician on a soldier, renowned for his bravery, is generally known: he bled him so profusely, that the man became timid and cowardly. Similar examples are met with among persons of the

soundest constitutions, who, through accident or disease, have lost a great quantity of blood. The constitution is weakened, anæmia predominates, or there is excess of aqueous fluids; the organization shaken, by a want of equilibrium; is greatly modified, and presents a sort of intermediate state, between health and disease: although life still exists, yet its energy and action are considerably diminished.

Maladies of every kind modify the constitution, and leave powerful traces of their fatal inroads. Some constitutions are ruined by a single inflammatory disease, though of short duration; others, when once affected, never recover their normal state, as the primary cause of the affections still exists.

Living in unwholesome situations, bad food, over exertion, late hours, conduce materially to injure the constitution.

The duration of the action of those agents that modify the constitution, indicate the progress of an acquired temperament. Habit, which blunts all feelings, whether of pain or pleasure, gradually admits the changes which, in the first instance, appear incompatible with the primitive constitution. It is owing to the power of habit that continual modifications improve the constitution, and well directed education counter balances all the anomalies of the physical state of the organs of the human frame.

It is in this philosophical and medical point of

view that the physical education of children should be considered; and it therefore requires the most sedulous care, and strictest attention. Discussions, relative to the state in which man comes from the hands of nature, are of no practical utility. Experience proves, that man is born with either a healthy or unhealthy constitution. In the first case, it must be carefully preserved; in the second case, endeavours should be made to improve it; but this great work cannot be suddenly effected; time, and the power of habit, can alone produce so desirable a result.

To procure for children a constitution of body, originally sound, the soundness of parents is indispensable. When, on the contrary, says Combe, young parents are immature, and comparatively feeble, what can they transmit to their offspring, but constitutional imperfection? As we are not legislators, we must leave children to be educated in their natural state, which we may really call a state, or constitution of chance; and try when they are unsound, to bring them to a normal state.

Dr. Pariset, in his work, "Hygiène des gens de Lettres," said, "he would take the strongest peasant, used to the inclemency of the seasons, accustomed to the roughest manner of living, and make him delicate, and nervous; his flabby, though ruddy, countenance, would soon prove, that his fibres had become lax, and the cellular tissue overburthened with fluid:

of a citizen of pallid complexion, weak organization, timid disposition, void of energy, he would make a soldier, a huntsman, or a sailor, whose strong muscular fibres, and compact bones, would denote intrepidity in danger.

Thus it is possible to weaken and destroy, to strengthen and improve, any constitution; the example of the celebrated *Abbé Rucellai*, related by the above mentioned author, is, we believe, not generally known.

He was very delicate; drank nothing but water, which was fetched from a great distance, on account of its purity; every trifling circumstance affected his health; warmth, cold, the least change of season, and temperature seemed to impair his constitution; the mere fear of illness made him keep his bed. Medical men are indebted to him for the introduction of *vapours*, a species of *non-descript* disease, which serves to occupy the rich and listless, and to make the fortune of those who attend them. This good *Abbé* groaned under the weight of his imaginary evils, and the dread of trouble or fatigue, rendered him averse to any undertaking. At last, stung by ambition, or rather by a love of revenge, he undertook to serve Catherine de Medicis in her intrigues; a task in which no small share of activity was requisite.

Employment appearing to him in the shape of a monster, he was on the point of giving up the project; when, conquering his aversion, he became so strong and active, that his friends

seeing him work all day, and take but slight repose at night; ride on bad horses; eat and drink whatever was offered him; inquired after the poor *Abbé Rucellai*, who could now scarcely be recognized.

This is a striking example of the changes that may take place in an individual; and shews how much we are the slaves of habit. Young persons are easily influenced. It is before growth is completed, that science and art may indeed be said to perform wonders. Old trees are not trained, but shrubs that easily take any given direction.

Now, that we have an idea of the material state of the subject of our studies, let us enquire what is our object? To obtain a long and healthy life? What is life? An admirable phenomenon, beyond definition; yet shall we try to explain that gift of God, which cannot be preserved, unless we submit to the conditions imposed on us.

CHAP. VI.

On Life.

When organized beings receive their natural shape, they acquire an internal strength, which for a certain time resists destruction; all is composition and decomposition in the human frame. Inorganized bodies are subjected to the laws of affinity only, while organized bodies are subjected to the laws of growth, uninfluenced by attraction. In living beings the phenomena of growth are far more complicated. The continued regularity of these phenomena and motion, is *life*. The spontaneous movement, independent of the laws of attraction, which govern all great inorganized bodies, constitutes life. To live, is to exist according to certain arrangements of the organs; to resist the action of surrounding agents, in every direction, assailing, or continually penetrating organized bodies. To live, is to decompose and appropriate the elements of the natural physical agents; to live, is to move alone; to live, is to feel; to live, is to breathe. The learned have often been reproached with quoting the ancients; this reproach is ill judged, for the ancients were acute observers; they sowed the seeds of science, which time has since ripened and developed.

The struggle of the great and little world (megacosm and microcosm) shows the incessant connexion of man with external agents,—air, stars, water, earth, animals, which powerfully modify the weakness of the human frame.

The air surrounds and penetrates us; the light and heat of the sun influence us; plants and animals become our substance: there is a species of struggle between man and external agents. Life seems to resist destruction; but if motion ceases; if the functions of the principal organs are suspended, life is extinct, and the human body becomes a prey to external agents.

Every thing is subjected to man during life. When in the enjoyment of all his energies, the elements respect him; but if his constitution be injured, his bodily re-action debilitated, his natural organization weakened, the external agents then become fearful enemies, against which it is almost impossible to contend; the air which gave life to the lungs, is too acute for a weak chest, and wastes it with frightful rapidity: restoring elements become injurious; the organs are weakened by the action of the same agents from which they have hitherto derived strength: harmony is destroyed, disorder arises in the functions, gradually increases, and the economy droops. Then woman, that living body, hitherto so attractive, so fascinating, scarcely preserves the least trace of beauty: the lovely flower fades; air, water, heat, all the elements unite to destroy this de-

licate and perfect organization; and soon, as Bossuet observed, there remains but an unformed mass, a *Je ne sais quoi*, that has no name in any language.

Thus according to the figurative expression of the ancients, there is a struggle, in which the living being appropriates all the elementary parts of the surrounding bodies; and when life is extinct, when motion has ceased, and of this wonderfully organized frame, nothing remains but mere matter, the agents that surround it, claim their principles, and this *Je ne sais quoi*, to which Bossuet alludes, being decomposed in oxigen, hydrogen, carbon, and azote, serves for new compositions; is transformed into new bodies, and recalls the mysteries of metempsycosis, revealed by Pythagoras.

But there is not only a struggle between life and death: during many years this struggle is a sort of gymnastic, to which all living bodies are subjected. As soon as the air reaches the lungs it is decomposed, and the newly-born infant appropriates it: air is necessary to its growth; it is not its enemy, for the child could not dispense with it. The lungs may be wasted and destroyed, if the organization be weak or impaired; but in a healthy state there exists between man and surrounding objects a tacit *consensus*, by which man remains under their dependence, provided he does not misuse his organization and his privileges.

Thus, the struggle is only fearful, when man

accidentally, or through excesses, infringes the laws which govern all living bodies; when he either neglects or refuses to satisfy the instinctive wants of his organization; when he disturbs the equilibrium which exists between the surrounding agents and himself; and when he rebels against the conditions imposed on his existence.

According to the views of nature, man should find in the agents that surround him, all the resources and advantages necessary to his organization. The lungs are prepared to receive the air which they must decompose; the eyes for the sensations of sight; the internal organs for the assimilation of food; the body is externally sensitive, and bears with it a regulator of the atmospheric temperature; all seems to be calculated for man's benefit; and thus it is easy to comprehend why philosophers have named him the king of nature; and so in fact he is; for he rules over its immense and sublime scenery. The organization of man is the most perfect; the Creator prepared himself for it, by the creation of innumerable beings, whose organization, though simple in the beginning, became more complicated, until it reached man, who is the concentrated representative of all. The opinion of the ancients should not, therefore, be entirely rejected.

When man is in a healthy state, and in full enjoyment of all his strength, his organization is in harmony with the surrounding agents; but if

born with a weak and vitiated constitution; if for inheritance, he brings the seeds of his destruction, or wildly dissipates his health, harmony is destroyed; and woman, that brilliant and lovely flower, that queen of the creation; if her still weaker and more delicate constitution meet with any serious shock; woman, like every other flower, bends on her stem; her beautiful colours fade, and the INTACTIBLE principle of life is gradually wasted, after vainly struggling to re-animate organs, exhausted, or struck with death.

Thus, life, that invaluable blessing, granted by nature to all organized beings, cannot exist without the benevolent excitation of physical agents. Air, light, heat, electricity, aliments, exercise, are all necessary to man.

Fancy the most perfect organization, the most ingenious mecanism: connect by mysterious links, bones, muscles, arteries, veins, nerves: yet, without the celestial fire, you will still have but inanimate statues, like Pygmalion's: there must be something from on high, foreign agents,—air, light, heat. Life always springs from above; the soul from heaven. Thus is man's organization like Memnon's statue, which only brought forth harmonious sounds when struck by the first rays of the rising sun.

To know the action of physical agents on our organs; to proportion and appropriate this action to our natural wants, so that nothing may disturb or destroy the harmony of the phenomena

of life, would be real science; and man would then attain his full development; he would, says Cabanis, pass through the different stages of life without any of the striking and lasting perturbations which constitute illness; he would experience no physical impairment, but that inevitable change resulting from the progress of years; he would not die of disease, and want of equilibrium, but gradually and slowly wear out, after having attained to a great and honourable old age.

CHAP. VII.

On the Influence of Air on living Bodies.

AIR is the principle of life: it surrounds and penetrates all organized bodies. No living being can dispense with air; it is as necessary to the growth and development of plants, as to the respiration and life of animals.

If air be the source of life, it is also the source of numerous diseases; for its properties vary considerably: the atmosphere when loaded with deleterious vapours becomes dangerous, and often proves fatal to those who are unable to resist its influence: its power is not merely confined to the respiration, it acts forcibly on the skin, which receiving all external excitations, may be compared to lungs extended over the whole surface of the body.

That portion of air which surrounds the earth, is named the atmosphere. Accumulated in any great quantity, it is visible and forms what is called the sky, which is situated between the sun, all the celestial bodies, and the earth.

A knowledge of the properties of air, naturally leads to that of its influence, and should not be neglected in physical education.

The existence of the weight of air was known to Aristotle. This great philosopher observed

that a bladder filled with air was heavier than when empty. Galileo gave the true solution of this problem: the invention of the barometer by his pupil Torricelli confirmed this discovery, and Pascal's experiments placed it beyond a doubt.

As the atmosphere sustains its own weight, the lower it descends the thicker and heavier it becomes. The weight and density of the air therefore diminish in proportion to its elevation above the level of the sea. This observation may be verified by those who have ascended high mountains, the Mont Blanc for instance, or others less steep, as the Jura or Puy de Dôme.

The lungs and other parts of the body are affected by the changes and weight of the atmosphere. If the monks of St. Bernard do not leave their mountains and breathe the strengthening air of the plains and valleys, they gradually waste away. At a certain height of the atmosphere, the air is so light, and so little oxygenated, that animals and plants cannot exist; at eighteen furlongs above the level of the sea, the grass is poor, stunted, and short; at thirty furlongs, there are no signs of vegetation. It is well known that trees growing in plains and vallies are much finer than those that grow on elevated mountains.

Animals and plants not only require an air, rich in the vital principle, but a certain degree of atmospheric pressure seems necessary to the preservation of their shape. When the atmosphere is light, the pores of the skin are relaxed, and the

vessels and veins swell. In the month of December, 1747, Duhamel observed that the barometer fell an inch and four lines in two days; the decrease in the weight of the air was considerable, and there were numerous sudden deaths.

On ascending a mountain, as the pressure of the air decreases, the respiration becomes laborious and painful, the arterial pulsations are accelerated, the heart beats quicker; some persons are seized with hemorrhage, others faint away: the oxygenation of the blood is more difficult, as the lungs are fuller, and respiration shorter; thus disorders are numerous. Elevated situations should be avoided by those who have short breath or any complaints of the lungs and heart; while low habitations are suited to those who can with less difficulty absorb a sufficient quantity of air for the oxygenation of the blood. When mountains are not very high, lymphatic and scrofulous individuals, and all those whose skin require stimulation, may derive immense benefit from a residence near them, particularly if the chest be large, if the lungs expand without difficulty in the pectoral cavity, and if the heart be very sound. Much has been said of the sagacity of the mountaineers, which is attributed to the pure and sharp air they breathe, but their great strength is owing to their mode of life, and to the obstacles they are accustomed to conquer, rather than to the air; for in plains and towns, without the excitation of the keen mountain air, they retain

the activity they acquired in childhood; whereas the inhabitants of towns, having at hand without trouble or culture, the produce of nature, are enervated and have a certain degree of indolence, they seldom overcome; but if sent on the mountains they acquire the activity of mountaineers; not because the air is sharp but because they lead a different life. This reminds us of Tasso's beautiful lines which contain not only a physiological fact but demonstrate great observation:

> La terra molle, e lietta e dilettosa,
> Simili a se gli abitator produce.
> Gerusal. lib. Canto 1.

The influence of air on man is not merely owing to its density and weight, but also to its chemical composition. Every one is aware that air is a combination of oxygen and azote, in the proportion of twenty-one parts of oxygen to seventy nine of azote. If these proportions change, and oxygen predominate, or diminish, the air becomes unfit for respiration; too much oxygen irritates the lungs, the absence of a due proportion of oxygen and too great a quantity of azote or carbonic acid is fatal, and life is lost for want of excitement. The lungs and surface of the body continually modify the chemical properties of air; the lungs absorb oxygen, and furnish carbonic acid; the surface of the body exhales a certain portion of this acid gas, so that were an animal

confined in place, in which air could not penetrate nor be renewed, the proportions would become unequal; the oxygen would be absorbed and replaced by a similar quantity of carbonic acid, and life would soon become extinct. By this operation suffocation is caused by charcoal, and asphyxia often takes place in crowds, and at theatres or routs, where pleasure has its dangers. As the lungs decompose the air, they constantly require a fresh supply, and if it fail, death must ensue.

One of the most awful facts that has been related respecting a number of persons breathing the same air in a confined place, is that disastrous affair at Calcutta, when a hundred and forty-six Englishmen, were shut up in a small room called the black hole, in such a want of space and air, that one hundred, and twenty three were found dead the next morning; those who were still alive, were in the most deplorable condition. Many other examples might be furnished illustrative of the destructive consequences of an inadequate supply of air. Walpole, in his letters, gives an account of some drunken constables who resolved to put the law in force against disorderly persons; they took up all individuals who passed, and locked them up in St. Martin's watch house; they were twenty six in number; their shrieks were horrible. One poor man called loudly for a glass of water, saying he would give the eighteen pence he possessed for it, but in vain; the door

was not opened till morning, when four of the prisoners were found dead, two expired shortly afterwards, and the remaining twenty were in a dreadful state of exhaustion.

Respiration cannot cease even for an instant, and as air is soon vitiated in a place where a number of persons are assembled, the custom of making several children sleep in one room closely shut up, is very injurious; during the eight or ten hours they remain in bed, the lungs continue to act, and the air becomes more and more impure; respiration is imperfect, and the transformation of black to red blood, is not properly performed, because there is less oxygen; and it is easy to conceive that it must have an evil influence on nutrition, and may, according, to Baudelocque, cause scrofula.

It is not only this disproportion of the different parts of air which renders it unwholesome: but the various miasms and vapours it contains. The decomposition of vegetable substances in the marshes, in the old as well as the new world, give rise to intermittent fevers, which are more or less dangerous. The malaria at Rome, the effluvia arising from stagnated water, and the putrefaction of vegetable substances, are extremely prejudicial to health; the inhabitants of marshy countries are pale, languid, emaciated, and drag on their painful existence near the very spot where life is poisoned by pestilential air.

If putrified vegetable substances fill the air

with deleterious exhalations, how much more dangerous are those arising from the putrefaction of animal bodies; near marshes intermittent fevers are very common; but where there is animal decomposition, typhus fevers and plague are often met with; we regret that in so enlightened a nation as England, the custom of burying persons in churches, still exists, and that burial grounds should be situated in the midst of so populous a city as London.

Every thing that vitiates the air, is injurious to health; however sweet the perfume of flowers, they should never be placed in sleeping apartments, nor in rooms where there is not a free current of air, as all plants absorb oxygen; if a rose be put under a bell glass, the air is deprived of one of its properties, becomes foul, and a candle will not burn in it, neither can an animal exist therein: it is true that verdure furnishes oxygen, but then again, flowers absorb it.

The only remedy for these exhalations, is to avoid the causes that produce them: to renew the air frequently is a salutary measure that cannot be dispensed with, or some unpleasant sensation soon proves that there is a want of equilibrium in its proportions.

The dust contained in the air, whether driven by the wind in an open field, or when gently moving in a drawing room, may give rise to divers affections of the eyes, the nostrils, the throat, the bronchi; hence the numerous

diseases obserable in different stations of life.

Stone quarriers and stone masons are subject to consumption, and spitting blood; delicate persons are liable to tracheal irritations, hemoptysiæ from merely swallowing the dust in a ball room, filled with particles of feathers and silk. Incessant coughing, which is attributed to cold, is generally caused by impure air: rooms inhabited by children should be frequently swept and dusted; the greater the number of scholars, the greater is the necessity for perfect cleanliness.

In Egypt, clouds of dust arise; and the inhabitants are afflicted with ophthalmia, owing to the irritation caused by small grains of sand flying into the eyelids. A learned Physician says, that the general use of coal fires in all the large towns in great Britain, owing to the quantity of sulphur this mineral contains, and of sulphuric acid fumes, and fuliginous matter generated, renders the air more irritating to the lungs, and increases the risk of a winter's residence in those places, to all persons who suffer from, or are ever liable to diseases of the respiratory organs; there is no town to which these observations are more applicable than to London.

Good air may, in many instances, counteract the injurious effects of bad food; and peasants in a great measure undoubtedly owe their strong constitutions to the pure air they breathe.

CHAP. VIII.

Influence of the Motion of the Air.

THE motion of the air, without regard to its state of humidity or dryness, acts on the animal economy, by insensibly increasing the perspiration, and depriving it of its caloric, in a greater or less degree, according to the rapidity or slowness of its motion; a circumstance which should be carefully observed. The wind, and a strong current of air, therefore, demand attention; it is necessary that we explain their action on the economy, as it is modified by dress, habitation, or shelter; and this we shall endeavour to accomplish, by relating an experiment. Later on we shall draw consequences from the prolegomena we bring forward.

The state of perspiration varies so frequently, that it would be impossible to say any thing precise respecting it; these fluctuations are ascribed to the continual motion of the atmosphere, acting imperceptibly on the animal economy.

In order to be perfectly acquainted with the influence of the air upon animals, Mr. Edwards suspended a certain number of frogs near a window that was kept shut, where they were sheltered from external air; and in the same apartment, near an open window, he hung some more

of these animals, so that as the air came into the room, it rushed on the latter, and only reached the former, after it had gone through the whole apartment. In this double experiment, even when the air was calm, the difference in the perspiration was very striking; the frogs near the open window, perspired twice as much as those that were at the opposite side of the room, and in a still greater degree, according to the intensity of the wind.

These experiments shew that when a great number of children are assembled together, if the windows are not kept shut, it may prove prejudicial for those who sit too near an open window or door. In most hospitals there are screens placed round the beds that are near the door, to shelter the patients from the wind, a plan which should be pursued in all schools.

Numerous experiments have decidedly proved, that if humidity does not entirely prevent perspiration, it diminishes it considerably; if it be suppressed, or interrupted for any length of time, the skin loses its secretive powers. The inhabitants of damp climates have generally lymphatic constitutions, enlargement of the glands, scrofulous and cutaneous diseases.

The incessant motion of the earth, the stars, and the sea, keeps the mass of gas which surrounds the terrestrial globe, in continual agitation; the atmosphere, therefore, is never perfectly calm. The air is either damp or dry, according to the re-

gions it traverses; and these great meteorological phenomena, subject man to divers vicissitudes, as sudden changes of temperature are extremely prejudicial to the constitution. Merely going from a warm to a cold room, suffices to disturb the functions of the skin, as the body may not then be in harmony with the surrounding physical agents. A due attention to this fact, so essential to the health, cannot be too earnestly impressed on the minds of those who have the charge of young females.

The density and thickness of the air are not the only qualities of a healthy atmosphere; it would be unfit for human development without other fluids, as caloric, light, electricity; thus, the human economy is in contact with all the physical agents of nature, and cannot exist without them. After having examined the different properties of air; its action on organized bodies, and principally on man, we shall pursue our study on the other physical agents, requisite to the development of the animal economy.

CHAP. IX.

On Heat and Cold.

THE opinion of many ancient philosophers, that *heat* was the soul of the world, does not surprise those who are acquainted with its different powers. In its natural state, caloric is found in all organized bodies, whose particles are separated by the presence, or united by the absence of heat. Caloric acts in a different direction to the laws of attraction, discovered by Newton. When in contact with our organs, it produces a sensation termed heat.

One of the most striking effects of heat is shewn in its action on water; which when deprived of its caloric, is condensed, and turned into ice; while, on the contrary, a certain degree of heat converts it into vapour. If caloric has so much power on an inert body, how much greater influence must it possess on living creatures, though they be endowed with a temperature which scarcely varies. Caloric dilates nearly all bodies.

The quantity of caloric contained in bodies, is called their temperature. The atmospheric temperature, whatevermay be its degree, has always an influence on the animal economy; this influence is less observable in a variable temperature; but a very hot, or very cold climate modifies the whole constitution.

In hot climates the brain loses its energy; the inhabitants are effeminate and indolent, always seeking repose. In southern countries, idleness is the pleasure so well defined, by the Italian adage, *il dolce far niente.* In Asia, Turkey, Africa, fatally privileged for slavery, the natives seem to want even sufficient strength to break their chains; whilst in Europe, where the climate is temperate, a spirit of independence prevails, and is continually struggling against the oldest and best established institutions.

In warm climates, life is sooner consumed; puberty, the critical age, and even death is premature; one year, passed under the tropics, is equal to two spent in Europe. The slightest wounds are followed by spasms and tetanus; muscular strength is in an inverse proportion to the sensitive faculties.

The temperature of hot climates is favourable to brain fevers and madness. In some countries heat is so intense, that it causes sudden death. Foaldo states that, in 1743, from the 14th to the 28th of July, eleven thousand women were found dead in the streets at Pekin.

In the summer months, diseases of the skin are more numerous, and contagion more frequent; this is the case in all warm climates.

But if excessive heat is to be avoided, a mild temperature may essentially benefit delicate constitutions, by assisting the development of weak organs, that are in a state of inactivity. Warmth,

by dilating the pores, and inducing perspiration, establishes an action between the interior and exterior fluids; the skin fills the perspiring functions, and gives to the whole economy the necessary vitality. All organized bodies require heat. Seed would not grow, unless surrounded by genial warmth, forming a sort of incubation; and a deviation of temperature gives life to thousands of creatures, which are destroyed by cold.

Warmth is essentially necessary to infants; without it, growth is impossible. In countries where the rays of the sun are seldom seen, the inhabitants are always short. We are here naturally led to speak of cold.

Cold is the decrease of caloric in bodies; it is the dimunition of a certain temperature; the negation of heat; and the more the caloric diminishes, the more intense is the cold.

In the north of the two continents, says Lacepede, nature repressed in its efforts, and circumscribed in its movements, seems ready to expire under the deadly power of rigorous cold. The Laponese, the Samoiedes, the Ostiacs, are seldom more than four feet high; which proves the deterioration of the human race, in its usual dimensions.

In cold countries, the organs are slowly developed, and females do not attain puberty before the age of eighteen or twenty. It is

principally as regards growth, that we wish to consider the effects of cold.

The younger a child is, the lower is its temperature, and the more it feels the cold. Instinct alone leads mothers to keep their infants warm. Philosophers have vainly endeavoured to persuade parents that cold strengthens children's constitutions. Happily, few mothers have the barbarous courage to follow these theoretical ideas, rather specious than judicious.

Children are much more liable to cold than adults, which however, is not the general opinion. Infants, in England, are scarcely covered, their little arms and legs are left naked, and are often blue with cold, because the circulation does not take place freely at the extremities. A practice so fraught with dangerous consequences should be discontinued, and a few examples of the effects of cold may, perhaps, be more useful than mere common-place observation.

A kitten, born on the 12th of February, taken from its mother, and exposed to the air, when the temperature was at 14 degrees, which lowered to 18° in nine hours, was stiff, and could scarcely move.

The following month, two kittens, a day old, when near their mother, were in a temperature of 37°; at a distance from her, in two hours their temperature lowered to 25°; in three hours to 18°,

and in four hours they were stiff, and scarcely alive.

The same experiments were made on dogs and birds; as their temperature decreased, they became motionless, and had they not been placed near a fire, or put in a warm bath, they must inevitably have perished.

Animals cannot always remain near their young, and keep their temperature in the same degree. Birds build their nests in sheltered spots, and carefully deposit all the shreds of wool and down they find, in order to create warmth for their young; and while the mother goes in search of food, the little creatures draw close together, and keep each other warm; yet maternal instinct and solicitude do not enable the parent to judge of the degree of cold produced by her absence; and it has been wisely ordained, that birds should be hatched in the spring, when the temperature is high, and the rays of the sun fertilize the earth. Summer is favourable to their growth, and before the approach of winter, they have acquired sufficient strength to bear the cold.

It is nevertheless to be observed, that a moderate degree of cold, gives activity to the digestive functions; the palpitations of the heart are stronger, respiration more easy, cutaneous perspiration is diminished, sometimes entirely suspended; the secretion of the kidneys increased, so that, if this state of the temperature be considered as tonic for some individuals, it is

prejudicial to those who have weak chests, palpitation of the heart; or are affected with any organic malady.

The fatal effects of cold, are painfully demonstrated in the exposure of foundlings, *enfans trouvés;* these unfortunate little beings are sometimes left with scarcely any covering; become chilled; the skin hardens; the perspiration is arrested; the blood rushes to the heart, and the large vessels; and it too frequently happens, that public charity comes too late to their assistance. Torn, by vice or poverty, from the maternal breast, they sink and perish with cold and hunger.

How numerous are the facts that could unfortunately, be brought forward, to shew the sufferings infants undergo from exposure to cold. In England it is the custom to take very young children, to be baptized, into churches generally cold, and frequently damp; their heads are uncovered, and cold water is sprinkled on them; a practice most injurious to delicate infants, unprepared to bear the sudden transition.

The French law requires that children should be brought to the *Mairie* within three days after their birth. Dr. Edwards consulted the returns made to the Minister for the Home Department, and found that the number of infantine deaths was by far greater in winter than in summer; and he also ascertained, that in villages where the inhabitants lived at a distance from the *Mairie*, the

mortality was more considerable than when the distance was short. Legislators certainly erred, in requiring infants to be exposed to the action of cold air before they had sufficient strength to resist its influence; and parents who, from system, have their children indiscriminately bathed in cold water every day in the year, carry a good principle beyond the limits of reason; and their innocent victims fall a sacrifice to misplaced kind intentions.

CHAP. X.

Light.

It is difficult to separate light from caloric, particularly in the rays of the sun; yet it may, perchance happen, and give rise to very curious phenomena. It is principally to the effect of light on the development of man, that we mean, at present, to confine our attention.

Light has different degrees of influence on animal economy, vegetation, and inorganized bodies. In the animal kingdom, solar rays produce effects that could not possibly take place in obscurity; the verdure of plants is owing to the influence of light; and it may be said, that man's colour or complexion is due to the same cause. Plants growing in shade or darkness are *etiolées*, lose their properties and consistence; increase in length, but are slender and weak. Human beings are equally dependent on the influence of light. If man be confined in a dungeon, or in any habitation where the rays of the sun do not penetrate, in cellars or mines, for example, his whole complexion turns sallow; his strength fails, and aqueous humours break out on his skin: persons who have been thus deprived of light become languid, and frequently dropsical. If the absence of light has so strong an influence on

adults, let us examine its operation on young animals.

The experiments made by Edwards are extremely interesting; he says that before animals come in contact with the exterior world, they have grown in darkness, and he has endeavoured to discover what influence light possesses independent of heat. To effect this purpose, he placed a certain number of frogs in two separate vases, filled with water; the one carefully wrapped up with an outside covering of black paper, the other left transparent; they were both placed in the same temperature; the light shining on the transparent vase, the eggs it contained were all hatched, while those in the dark were not so.

But even were it possible, that under more favourable circumstances, the development could take place without light, the experiment just related, proves how fully this agent contributes to growth.

It is principally after birth, that it is interesting to discover the full effects of light on the development of the body, as all animals are more or less exposed to it; yet, it is difficult, although with growth their shape be changed, precisely to remark and appreciate the modifications, unless we select a species among the vertebrated class, whose development offers a precise and palpable difference.

Frogs are admirably suited for these experi-

ments; in the first instance, they are like fishes, having no limbs, but a tail and fins; in their second stage, they are reptiles, bearing no resemblance to fish; they have four limbs, no tail, no fins; the metamorphosis is complete. Changes so marked, offered to the experimentalists the hope of being enabled to settle a point so important to science, and the following is the result.

In order to continue his experiments, Edwards used a tin box, made expressly for the purpose, divided into twelve parts, each being numbered, and pierced with small holes, so as to admit the water; then, taking some tadpoles, he weighed them, and placed one in each of the twelve compartments; the box was put into the river, a few feet under water.

Several more of these animals were thrown into an earthen pan, containing thirty pounds of water, from the Seine, which was changed every day. These tadpoles could reach the surface of the water, and breathe the fresh air; and they shortly appeared in the most perfect form; whilst, of those in the box, under water, ten out of twelve underwent no change, though they were considerably grown; some were twice, others three times as heavy as when first shut up; besides which, when the experiment was begun, they were already near the period when the metamorphosis takes place: two were transformed, but at a much later period than those exposed to light and air.

These experiments clearly prove, that the

want of light does not absolutely prevent the growth of *batraciens;* though only two, out of twelve, kept in darknes, were metamorphosed; while all those exposed to light and air, underwent the usual transformation.

Reflecting upon these facts, says Edwards, it is evident, that the action of light aids the development of the different parts of the body, in that just proportion which constitutes the type of the species: this type is only characterized in the adult age. These changes are more striking in young subjects, and in the species used in the experiment just cited, the transition is most remarkable.

The principle deduced from the experiments on animals, naturally leads to the following considerations, relative to man, in climates where nakedness is not incompatible with health.

The exposition of the whole body to light, is very favorable to its regular conformation; a fact corroborated by the observation of Humbolt, in a voyage to the equinoctial regions.* Speaking of the Chaymas, he observes, "both men and women, are muscular, though thin. I saw no sign of any natural deformity. I could say the same of thousands of Caribs, Indians, Mexicans, and Peruvians, whom in five years, I had full opportunity of observing. Deformity and distortions of the body, are rare among a certain

* Paris, 1814, 4to. p. 147.

race of men, particularly with those who have the dermoid system, strongly coloured. I cannot think they depend entirely on the progress of civilization, effeminacy of life, and corrupted manners; but whatever may be the multiplicity of causes that produces them, we cannot doubt that a deficiency of the action of light upon the surface of the body contributes to these distortions of shape in the soft and indurated parts of children affected with scrofula, mostly found among the poor, who inhabit narrow dark lanes."

"It follows, from the same principle," continues Edwards, "that when these deviations do not appear incurable, exposure to the sun, in open air, is one of the means most likely to aid recovery. Thus, the influence of light on different organized bodies, merits the greatest attention. In subterraneous caverns, if there be any vegetation, it is confined to moss. When plants are kept in the dark, they lose their shape and flavour; the growth of animals is arrested, when they are deprived of light; and if left in obscurity, for any length of time, the human frame becomes quite altered.

In some individuals, there is a predominance of lymphatic and liquid vessels; complete atony is spread on the surface of the body; not only in individuals buried in mines and caves, but this paleness is also observable in females of delicate constitutions, who, through fear of destroying their complexion, sedulously avoid broad day light, instead of seeking the genial heat of the

sun, which would strengthen and improve the skin; yet they have no dread of artificial light, lamps, wax candles, and gas; the whole lustre of which could never, in its beneficial operation, supply the place of one ray of sunshine. The experiments of Edwards, and the observations of Humbolt, and other naturalists, deserve to be considered; they shew the benefits to be derived from light in the treatment of deformities, and this knowledge is invaluable to those concerned in physical education.

Among the numerous works that have come under our notice, none contain sufficient information on the important subject of the influence of physical agents on the development and preservation of life; this omission must be rectified. It would be wrong to suppose that exposure to the sun may not be attended with danger; too great a degree of heat causes erysipelas, brain fevers, apoplexy, mental aberration. But there are rules to be followed for light as well as for other agents; and medical men should give the most minute directions respecting the means to be followed for strengthening constitutions, and when the solar rays are employed as a therapeutic agent, for assisting the normal developments of the human body. However this may be, the experiments and observations here related, cannot be void of interest to judicious practitioners, and enlightened readers; and we feel convinced that their application will easily be found.

CHAP. XI.

Electricity.

De Humbolt, considers that the dimunition in the quantity of electric fluid contributes to the development and increase of scrofula; this opinion does not seem to be founded on any positive fact; yet it may be admitted that electrical fluid has a powerful effect on the human economy.

Botanists have regarded the vernal rising of the sap, and the growth of plants as effected by electrical causes; "in proof of this," says Foster, "I may observe, that I have found hail and snow so generally the vehicle of electricity, to be more conducive to early vegetation than a warmer air in a dry spring, or one which was attended by much unwholesome non-electric rain.

The learned Abbé Bertholon goes further, and asserts, that plants growing near to conductors of atmospherical electricity, flourish better than those that are distant from them; and he relates one remarkable instance in France, in which some jessamine shrubs were planted against the side of a house, down which was carried an electric conductor; of these jessamines, those which grew near the insertion of the metallic rod acquired three times the size of the others, and extended so high as to reach the upper windows.

If we could infer from these instances that the electrical fluid acts on the human economy, as on plants, the opinion of De Humbolt would deserve attention. "It has been a popular notion," says Foster, "that atmospheric changes have an influence on the state of human health." Such a belief appears to be founded on reason; for since a number of persons, of various ages, constitutions, and habits of life, at different places, become the subjects of disorder at the same time, it is rational to attribute their malady to some general cause; and the occurrence of disorder in particular kinds of weather, or at stated seasons of the year, naturally suggests the opinion that such cause resides in the air. "But it appears to me," says the same author, "that it is not the heat, the cold, the dampness, or the draught of the air, which is chiefly concerned in causing disorders; nor the sudden change from one to another of these states; but it is some peculiarity in its impregnations, combined with its electric state."

That electricity has powerful influence on man, is a fact beyond doubt; but it is very difficult to say, what power it may have in physical education, as we are but imperfectly acquainted with its mode of action; and we ought to abstain from any theory which would not lead to practical results.

CHAP XII.

Diet.

An acquaintance with the laws presiding over organized bodies, and those necessary to the preservation of life, fully demonstrates the importance of regular diet, which seems to require a much greater share of attention than it generally obtains. Physical education is too frequently left to chance, and the preservation of horses may be said to attract more notice than the health of man, which if not entirely misunderstood, is often wholly neglected.

The first duty of parents for children, if sickly from birth, or affected with any hereditary disease, is to provide strong healthy nurses. Let Rousseau declaim against those mothers who do not nurse their own children; they act both wisely and humanely, in giving their infants better milk than their own. Nature has made it woman's duty to nurse her own child; but if the maternal breast contains poison, has nature ordained that it should be given to the infant?

Children who most require the benefit of physical education, guided by experience enlightened by science, are precisely those born with some defect, or springing from an impure source.

It was easy for Rousseau to lay down rules for children free from defect; it was very easy

for him to say, they did not require medical aid. Following the blind and guilty sophisms of false philosophy and egotism, he never observed the numerous diseases common to infancy; he never had to rear feeble or deformed children; never felt his heart beat for the untold sufferings of his own offspring: and the man who could shamefully throw his innocent children among public foundlings, was unworthy to lay down rules for the education of others.

"It is impossible to find a good nurse," says Rousseau, "for a bad mother cannot be a good nurse." It is quite evident that the Genevese philosopher lived in a fanciful world of his own creation; and absent from general society. Had he been acquainted with the daily occurrences of real life, he would have known that it often happens, that a poor but robust and healthy mother gives her milk to a stranger, in order to provide bread for herself and children.

When a mother is of a sound constitution, and in good health, there can be no hesitation in saying, she should suckle her own infant; she is then better able than any one, to perform this pleasing duty, to which nature has attached such delightful sensations. But if a mother has but little milk; or if she be in delicate health, or of a bad constitution, scrofulous or consumptive, a good nurse is most indispensable.

It is irrational to say children have nothing to fear from the blood of which they are formed. It

may be so, when the blood is pure and healthy; but it is completely false when the fluids are corrupted by disease, or weakened by a naturally bad constitution.

No doubt can exist as to the difficulty of procuring a good nurse; no pains should be spared to obtain a person with the necessary requisites; her health, habitation, diet, habits, moral feelings, are important points, with which the parents should be well acquainted. A very feeble child was, not long since, confided to a mercenary female, residing in a small dirty house, in an unhealthy neighbourhood; the infant gradually wasted away, and there seemed little hopes of its recovery, when it was fortunately removed to Hampstead; in less than a fortnight the child rallied, and continues to improve rapidly.

Women addicted to drink, are not fit to be nurses. Leroy says, "that having prescribed the human milk for a lady in a very delicate state of health, she derived great benefit from it; but the nurse having drank too much, the milk was sour, and brought on fever, and nausea. Infants, who have taken unwholesome milk, are feverish and uneasy, and their cries plaintive."

It is essential for a nurse to have good food, and exercise, and to be free from moral excitement. Albinus relates that a woman suckled her child after a violent fit of passion; the child was seized with strong convulsions, and died. Clarke refers to a similar fact. We shall not make any

further observation, as there are numerous works on the subject; but lactation being so essential to life, we were unwilling to leave it unnoticed.

Parents sometimes prefer bringing up their children by hand, and in some cases this plan has proved successful; but as a general rule, we cannot think a dry-nurse preferable to a wet one. Food must be regulated according to the age and strength of the child; for as it grows, the maternal milk increases in strength. It is always judicious to imitate nature, and the food given to infants should be gradually more nourishing.

Convulsions are brought on by giving children too much to eat; these convulsions are caused by bad digestion. Mauriceau relates a case of a child who died from having taken too large a portion of food, which proves the necessity of regulating diet.

Children should be accustomed to take wholesome nourishment, and not be encouraged in prejudices and fanciful aversions; meat and vegetables are best suited to them; roast meat is preferable to boiled; there is more juice, a less quantity is requisite, and the digestive organs are not loaded. Meat unaccompanied by vegetables, brings on costiveness, and should therefore, be avoided.

Frequent nourishment is requisite for growing

children, to aid their development, and repair the waste occasioned by exercise, and the operation of other functions.

Prolonged abstinence renders every organ and function more than usually susceptible, and liable to contract disease. Some persons cannot give any degree of attention to their occupations till they have taken nourishment; and if rules be laid down for early rising, study, and exercise, stated hours should also be fixed for meals. Regular diet contributes to regularity of growth. Let two plants, in similar condition, be placed in a garden, the one watered daily, the other only watered occasionally; the difference in their growth will be very striking.

Children kept too long without food, eat voraciously; the digestive functions are injured, and the general health affected.

In the general laws of nature, all is regular; confusion and irregularity are merely accidental; at other times only apparent: but in the development of organized beings these laws are constant.

It is natural for young people to grow by degrees, and slowly to arrive at that state of perfection and beauty we so ardently admire. There are many incidents in life, over which we have no control, that may engender weakness and deformity, but we should not wilfully contribute to them. Irregularity of meals is

an error to be avoided; it causes irregularity of growth, establishes moral and physical versatility, which by no means conduces to happiness in later life.

If we admit that regularity at meals be necessary to regulate growth, it naturally follows that regularity in the one produces regularity in the other, and that sudden growth may be thus avoided. When children grow rapidly, they require good nourishment, and the calls of hunger must not be neglected; yet great moderation is essential, as there may be a tendency to disease in some of the most important organs of the economy.

During the first months of life, nature has indicated what is best suited to infants. It seems natural to wean them when they have teeth; but they must be gradually used to a nourishment different to what they take from the breast; milk, however, should long form a part of their diet. Vegetables, and the tender flesh of young animals, are admirably adapted to the next stage of growth; and as children increase in years, stronger nourishment is desirable; they grow faster, and the tissues acquire a greater degree of strength.

Food, of a quality too substantial, is never adapted to females; their constitutions are elastic, their tissues more fully impregnated with fluids; mixed diet of animal and vegetable food is best fitted for their organization; milk,

fruit, vegetables, and tender meat, will generally be found most beneficial.

Mountaineers live principally on milk; their dispositions are mild, their constitutions good, and their complexion beautiful; these advantages are partly due to their diet. We will not renew the polemic of philosophers, who assert that animal food engenders cruelty, and tends to modify our naturally good dispositions; but we ought to acknowledge, that shepherds, who feed on milk and vegetables, have gentle manners; and if nutrition have so direct an action on the mind, it could be wished that woman should adopt a regimen which might contribute to ensure a continuance of those treasures of love and gentleness she has it in her power to shower on man from the cradle to the tomb. We, therefore, do not agree with Brillat, Savarin, and Rousseau, in admitting that woman may be a disciple of Epicurus without detriment to herself.

Milk is easy of digestion, and contains particles of azote, as well as the most substantial meat. Fruits and vegetables are not equally wholesome; they must arrive at maturity before they are digestible. Unripe fruit is not only unwholesome, but dangerous, and should never be given to children; vegetables are necessary to counterbalance the effects of too rich nourishment.

Fish, if not light, is unfit for children; fresh-water

fish is, considered preferable; salmon, eels, and divers other sorts, are very indigestible. Salt and dried fish is much used in cold climates, but causes eruptions and herpes, and is not wholesome food during growth.

Water is the most common, and most healthy beverage, when it is of a wholesome nature. Spring water is preferable to any other; and water that has run over beds of rock or sand, is generally good; water in which soap does not dissolve, and which is unfit for cooking, should not be used to drink. When water is not very pure, a little bread, well toasted, and left to steep, will render it more agreeable to the palate, and more wholesome. Water may also be boiled, and left to cool before it is used; but, it is then deprived of air, which is a disadvantage.

Plato advised, that no persons should taste wine till they had reached eighteen years of age. In public schools, if the water be not good, a small portion of wine is mixed with it, which annuls the bad effects that might result from taking it pure. Some weakly constituted children require slight tonics, to facilitate the digestion; a small quantity of beer is often found of great service for weak and scrofulous children. Cider gives worms; the more simple the beverage, the more it conduces to health. Beer, which is only good when fresh, and unmixed with the juice of narcotic plants, wine and water, or pure water, are by far the most wholesome beverage.

There is a very common prejudice existing, both in England and France, which it should be our earnest endeavour to remove. Young people, forming the standard for beauty from their own fancy, and not according to real good taste, have a great dread of becoming too stout, and considering elegance consists in being thin, endeavour, by all possible means, to attain the desired end, and injure their health, by continually drinking vinegar; nothing can possibly prove more detrimental to the constitution, and to good looks. A lady, without being stout, may be handsome; but a very thin person, appearing fit for an anatomical study, can have no pretensions to beauty.

It was not thus the Greeks understood beauty; it is not with skinny necks, and a frame scarcely covered with flesh, that the lovely women of Circassia, Italy, France, and England, serve as models for painters and statuaries, and rival the splendid remains of antiquity.

If a young girl be naturally inclined to an excess of *embonpoint*, the appetite should be moderated, and regular exercise taken. We here give the real secret for preventing lustiness, and the remedy is not only free from danger, but conducive to health; while acidulated beverage is detrimental both to health and beauty.

When the adipose tissue is diminished and deteriorated by these artificial means, which in reality constitutes disease, the bones grow longer,

the chest narrower, and a rapid consumption sometimes takes place.

Thus, regularity is necessary to the perfection of growth, and may greatly contribute to the cure of any practical deviation arising from too precocious development. To be careful in the choice of food, and adapt it to the different age and different state of children's health, should be the invariable study of good mothers, and enlightened governesses.

But if the human body may be compared to numerous cells destined for the reception of divers materials, and that different species of food powerfully modifies the constitution; if some aliments are nourishing, others deleterious; if each substance furnishes its own peculiar property, and modifies our feelings; if the inhabitants of the South of France are more lively than those of the North; this fact once established, nutrition may then be adapted to each individual, and employed adjunctive to other means, in the correction of constitutional defects, as well as corporal deviation.

In terminating this chapter, there is a point on which we feel the propriety of insisting, —temperance in early life: modified, according to the climate, and the habits of the people, it is every where, the tenure on which man holds his health. With temperance, says an English traveller, we may traverse the frozen

mountains of polar ice, or bask in the warm vallies which lie along the sun's path. We may bear vicissitudes of heat and cold, and cross and recross the equator. In voyages and travels, we cannot always eat of our accustomed diet, nor dine at our usual hours; but we may contrive to observe the laws of temperance. It was this idea of the troubles and irregularity of life, which led Locke to assert, that it was not necessary to observe a regular diet; this, however, was a false idea, not at all adaptable for rearing young children

The stomach is one of the first organs claiming *physical education;* if we eat when we are not hungry; if we take substance not adapted to the wants of the stomach, indigestion is the natural consequence; and the food remaining in the sac of the stomach, nearly in the state in which it was swallowed, occasions uncomfortable sensations, and after a time passes in a crude or undigested state into the intestines, in which it frequently occasions colic, and other painful sensations, and by sympathy, pain in the head and other parts of the body.

CHAP. XIII.

On Exercise.

WHAT power can the body attain if be not exercised? Were we to keep the suckling twenty years in swaddling clothes, we should have a helpless monster; a babe of twenty, that could neither walk nor stand, merely from want of exercise.

The ancients were so fully aware of the importance of exercise, that they considered it one of the first requisites in education. Legislators and philosophers pointed out the advantages of exercise, and not satisfied with applying it to the development of the organs, had also recourse to it as a therapeutic agent.

Life could not be maintained in organs remaining in perfect repose; all is agitation, all is movement in organized bodies; and both internal and external motion are symptoms of life. Plants though fixed to the soil, are shaken by the winds, and this agitation is eminently useful to their development.

Besides internal movements, not in abeyance to the will, and which cause the heart to beat, the lungs to expand, and the stomach to digest, man is subject to involuntary internal movements, which give a new impulsion to the frame. If man does not take exercise, his functions soon

languish, for he is deprived of one of the mos powerful stimulants of his organization; all depends on motion, even thought, which is enlarged by sensation.

The object of motion is, to exercise the organs, so as to maintain a degree of action adapted to their natural destination; these different movements must be regular, gradual, and suited to constitution, age, and sex; they are essential to health, and are known by the name of gymnastics.

Systematic exercises are useful or prejudicial, in proportion to their moderation or excess; hence, the importance that should be given to them in the physical education of young ladies, to whom no exercise has yet been judiciously adapted, though military and other exercises have been indiscriminately used.

Moderate exercise, consistent with the general state of health is invaluable; a certain degree of exercise may be considered desirable at all the different epochs of life, unless the body be affected with any disease that destroys the natural connexion existing between the organs; or has caused such a degree of weakness as to preclude the possibility of exercise without danger.

The effect of exercise is to develop any particular organ, or to give to the organ an increase of blood or nutrition; more heat is felt, the organ

is sooner developed, and acquires a certain steadiness and perfection which did not previously belong to it.

The effects produced on the osseous system, by want of exercise, may not at first be so obvious as the effects on the muscles, but they are occasionally exemplified in a very striking manner. If, according to Shaw, a soldier, in active service, receive a wound which necessitates immediate amputation; or if a strong labourer meets with an accident, and undergoes an operation while in full health, the bone is hard and compact in structure; but if either the soldier or hospital patient should, in consequence of the accident, be compelled to remain in bed some time before the operation is performed, the bone is soft and spongy, similar to that of a scrofulous person. A remarkable instance of this is preserved in Mr. Bell's museum; another example is recorded by Cheselden.

The nutritive functions, respiration, and secretion, are increased by exercise. During growth, the exercise of the voluntary muscles, acts powerfully on the osseous system; and then ill directed exercises may cause the body to contract deviations, which might never have existed, but for over exertion and bad attitudes. With young girls of regular growth, and whose constitutions happily offer a just equilibrium of all parts of the body, moderate exercise develops the muscular

system, and gives a greater degree of strength to the tissues; stimulates nutrition, and enlivens the whole organization.

But it must be remembered, that exercise should be proportioned to the general strength of the organs; and that a similar degree of exercise cannot be equally well adapted to all young ladies; for though their age may be the same, their constitutions are probably different, and their growth may not be equal.

The ancients paid special attention to physical beauty, and subjected all young people to exercises agreeable to their sex, and situation in life; but the precepts of the ancients have been exaggerated, and the results of injudicious exercises have too often proved fatal.

In 1820, a work appeared in London, entitled Calisthenics, in which the gymnastic exercises of Clias were recommended, and became fashionable. All parents were anxious for their daughters to be taught to perform these evolutions; but those mothers endowed with observation and good judgment, soon perceived that their children's figure, instead of being developed in the Grecian style, were rendered imperfect; the arms, instead of round and graceful, were knotty and rough; and having no desire that their daughters should become pugilists, they wisely abstained from allowing these exercises to be continued.

But while we disapprove of the gymnastic exercises introduced into England by Clias, can

we fully approve of the exercises since substituted, and known by the name of Calisthenics? These exercises though less violent, are not free from danger. Donald Waker, who has written on exercise, and collected, with great judgment, the opinions of divers authors on the subject, has added various engravings to the work, and described new exercises, under the name of Indian sceptre exercises; but Mr. Walker, in acknowledging the habits and attitudes which might cause spinal distortion, was mistaken in supposing that regular exercise was suited to children having the slightest deviation.

Mr. Walker's exercises for young ladies are calculated for well made figures. In other cases, exercise would develop the muscular power, and bodily strength; but it would also develop the irregularity of the body. Exercise can only increase the existing evil; particularly if this exercise be applied to the whole body, and not to the part most requiring development. In reading Donald Walker, we were surprised only to have found exercises for well made children; the wand, the dumb bells, and Indian sceptre, may be useful to the development of the body, but they would also develop the deformity, and increase, not cure it.

Excess of exercise wears out the vital faculties, stiffens the fibres, deprives the skin of its freshness, withers the flowers of youth, brings on premature old age, and death.

Ancient authors observed, that inhabitants who had signalized themselves by their valour in youth, seldom obtained a similar share of glory in their later years, when they fought for prizes; and Aristotle asserted, that at the Olympic games, there were not more than two or three gladiators who preserved a degree of strength equal to that displayed in early youth; and he accounts for the fact, by the excess of exertion required as children, which was by far too great from them, and could not be maintained till they reached manhood.

If all that has been written concerning gymnastics among the ancients, was carefully perused by unprejudiced persons, it would be found, that for young people, these exercises were confined to dancing; and that, if at Sparta they ran and wrestled in a state of nudity, it should be remembered, there was a place where all infants were cast when the slightest physical defect was discovered, or their constitution was weak or delicate. It is by no means proved that Spartan women owed their health and strength to wrestling; and even were it so, why should the present and the future be enslaved by the past. Is there nothing but perfection in what is gone by?—have we made no progress?

Let the past be well considered, and then its errors will be evident; the wrestling of the female Lacedemonians, proves the most striking ignorance of the physical organization of woman. A little

observation will suffice to overthrow the superstructure erected on Spartan gymnastics. Violent exercise has a powerful influence over the whole system. Leaping, falls, struggles, must be followed by various derangements in the constitution.

Those who are ignorant of the causes and consequences of these derangements, may admire the wrestling of the Lacedemonians; but an acquaintance with these causes and consequences demonstrate the dangers that may arise from these injudicious exercises; and had all the ancients agreed in praising the Spartan gymnastics alluded to, for young ladies, we should still retain our opinion. There is something that takes precedence over antiquity and tradition,—nature or woman's own organization. Nature has wisely ordained that, in all countries, instinct should lead females to prefer quiet and peaceable occupations.

From what precedes, let it not be supposed that we disapprove of all juvenile exercises; we condemn only the application of Spartan gymnastics to the delicate natives of London or Paris.

Let exercises be gradual, adapted to our morals, to the constitution of young ladies, and their hereditary or acquired state; this is our candid idea, and will be continually manifested in our observations on female gymnastics. Notwithstanding our remarks on the ancients, our disapprobation has its limits. In our theological

allegories, the most forcible truths are slightly disguised. Does not the huntress, Diana, represent exercise? and are not her virtues supposed to be the result of occupations that may truly be the guardian of chastity and virtue? Diana may serve as a model to young people; let them be active, industrious, diligent, and they will retain the greatest ornament of their sex. Thus the ancients represented Diana as chastity, and offered her as an example to youth.

The allegory of Prometheus, so well explained by Chancellor Bacon, is meant to shew the power of muscular exercise, after debility has been caused by excess of application. Prometheus, led by a love of science, and a wish to discover the secrets of nature, carried off some of the celestial fire; and as a punishment for this offence, was condemned by the gods to have his entrails gnawed by a vulture; a faithful picture of artists and scientific men, who are induced to rob celestial fire; thus destroying, by an absence of equilibrium, the harmony of the functions.

Hercules, the prototype of muscular force, and the emblem of exercise, at last delivers Prometheus. Can the assistance of gymnastic exercise be represented in a more pleasing form?

To languid and sentimental, nervous and romantic young ladies, we strongly recommend Diana as an example.

CHAP. XIV.

Climate or Habitation.

CLIMATE is the reunion of physical circumstances attached to each locality, and the habits in which these circumstances originated. The organization of man carries with it the stamp of the climate he inhabits, and his native land is the most favorable situation for the preservation of life. Man is formed for his climate, it seems adapted to the human constitution, and this admirable equilibrium unites him by the strongest ties to the place of his birth; for which reason patriotism is termed instinct. There is an irresistible attraction in the spot were first we received life, and where our early days were happily passed: that the delightful recollections associated with childhood should influence us in later life, is the natural consequence of the power of early impressions.

Patriotism has ever been the favorite theme of poets; yet have they not sought the origin of this ardent and lasting passion, which so forcibly contributes to the formation of our tastes and inclinations, and gives so powerful a duration to the temper, and national character.

Human beings are endowed with extreme sensibility; whatever has any action on living bodies, has a still higher degree of influence on man: his natural disposition is modified by daily

occurrences, whence arise decisions proceeding from habit, that may be justly termed second nature.

"There are," says Hippocrates, "rugged mountains and extensive plains, the inhabitants of which are stamped by nature, born stout and vigorous; circumstances seem to have prepared them for the most arduous undertakings, and they boldly rush into the midst of danger to seek their daily food. It has been wisely ordained by Providence, that man should be formed for his native country, and that the country which gave him birth should be suited to his tastes and habits."

The temperature, the hygrometrical state of the air, the varieties of atmospheric pressure; the aspect of the clouds, of the heavens, of the sea; nourishment, novel impressions of every description, influence man, even without his own knowlege. This influence of external agents, acts more forcibly at times on young children; at other periods, it has greater power over adults.

In transplanting exotics, naturalists carefully adapt the artificial climate to the nature of the plants, as they have been taught by experience, that this precaution is necessary to prevent total degeneracy, or death. Why is not an equal degree of care bestowed on children? It is not the temperature and the atmosphere which alone have a direct action on them, taken from their native home; but it is all the surrounding objects

that strike the young imagination and leave most forcible impressions.

In a pleasant and airy cottage situated near the village of Brives, lived Adeline de St. Geran, with her aged grandmother. Her parents resided in Paris, but thinking that the earlier years of their little girl could be more profitably spent in the quiet seclusion of Brives, than in the noise and bustle of the metropolis, they confided her, though unwillingly, to the fostering and affectionate care of their kind relative. Adeline was happy and contented, her good behaviour gained her the esteem of all; the old women in the village, and the few companions with whom she was intimate, held her up as a model of amiability and obedience; and she was generally beloved. Her favorite amusements were not found in the recreations most common to youth; she was a complete child of nature, and would pass hours in the fields, with no other company than that of a flock of sheep, who feared not to approach her, or even to repose at her feet. Among their number, Adeline had selected one pet lamb, and she never passed a day, without feeding and caressing her favorite, who always ran to meet her.

She was of a lively disposition, and strong constitution. At ten years old, she was sent to Paris, where her family resided, in an airy situation; but there was only a small garden. The child seemed to want air, she missed her play fellow,

grew thin, melancholy, and lost her appetite; whenever she talked, it was of the lambs and meadows; she gradually wasted away, and at last became weak, and could scarcely walk. Change of air was recommended by the medical attendant, but the fond parents, unwilling to part with their child, endeavoured to amuse her by taking her to the bois de Boulogne, to Vincennes, and the Tuilleries: there, the trees were covered with dust, not fresh and green as in her native village; and they gave no pleasure to the young invalid, who was finally sent back to her grandmother. As soon as she left Paris her cheerfulness returned; she was soon able to run about the fields, and speedily recovered her good spirits, and fresh color; she was afterwards occasionally brought to Paris for a short time, and at length became used to the atmosphere of the large city, which no longer proved injurious to her health.

Gradual change, enlightened care, are essentially necessary to the preservation of man. Human beings cannot be treated as automatons; they must be in harmony with the climate they inhabit; and should a change of scene and mode of life take place, due regard must be paid to previous habits. These observations may be justly applied to children taken from the paternal roof, placed at school, and suddenly deprived of the comforts they enjoyed at home. The absence of these comforts may not perhaps be detrimental to their

health; but the sudden transition from one place to another, without gradual preparation, might be attended with the most serious results.

The following statement will serve to elucidate how injurious these sudden changes may prove.

A German princess staying at Barege for the benefit of the waters, accidentally met a poor little shepherd boy: left an orphan in his early years, he had never known the comforts of a home; his bed was turf, his canopy Heaven: accustomed to roam over the fields with his sheep, and eat food of the coarsest description, he lived happily and contented, and was in the enjoyment of health, that choice blessing, without which all is blank and dreary. The princess saw him, pitied him, loved him; the boy was mild, beautiful, and candid; his kind benefactress took him to her home, loaded him with favours; he was clothed in fine raiment, fed at a luxurious table, slept on a bed of down; but his fresh colour disappeared, his cheerfulness forsook him; he drooped and died, in less than twelve months after his departure from his lambs and meadows: he fell a victim to the sudden change in his mode of life.

In Physical Education it is not only essential to attend to the state of the atmosphere, and the quality of the food, but the previous manner of living calls for the most serious consideration; and it is desirable gradually to prepare children for any alteration that is to occur.

Grown up persons, soldiers and sailors, are

sometimes painfully affected by a removal from their native land: the Ranz des vaches has always greatly influenced the Swiss at a distance from their chalets: and when Napoleon inquired of Canova, the cause of his melancholy, and distaste for the arts, of which he had hitherto been so passionately fond—the great artist replied, "*alle mie inspirazione manca il cielo di Roma,*"

A general knowledge of the effects of temperature and physical elements, may suffice for persons who have the care of dumb animals and plants, but deeper information should be found in those who undertake the charge of human beings. Every thing that tends to their mental or physical improvement should command attention; their habitations should be selected so as to combine all possible advantages; they should be spacious, the rooms lofty, exposed to the rays of the sun, and sheltered from the easterly winds; surrounded by a large garden or playing ground.

When a child falls away without any apparent cause of organic disease, an immediate change of air mostly proves beneficial. There are sometimes local causes of disease which affect only certain weak constitutions; there is no better remedy than to send the young sufferers into the country, and let them, as much as possible, be kept in the open air: to remove children to a healthy distance from their usual residence, is a general medicine, the powerful effects of which are too little known.

A boy, four years of age, was lately placed

under our care; his skin was flabby, his muscles weak, his nails brittle, his hair rough; his tongue pealing, his digestion bad; glands were felt in the neck and throat. The child had lost the use of one of his legs, and was unable to walk; yet he uttered no complaints, but vegetated for some time, and at last fell into a state of insensibility, from which his recovery seemed very doubtful. We prescribed gentle tonics, and ordered his immediate departure for the country. Three months had not elapsed, ere the child was cured; he regained his natural liveliness, and continues to improve daily. Examples of remarkable cures in early life, are by no means uncommon, provided the disease be not allowed to take too deep root, and that in recommending change of air, the transition be gradual.

The climate, or proper place to rear a child, should possess all the advantages we have enumerated. Climate must be adapted to the state of the constitution; elevated situations are not desirable, when the chest is narrow, or there is predisposition to pulmonary affections. It is sometimes possible to obtain an artificial climate, by merely changing the room in which a child is accustomed to reside; and letting him have the rays of the sun, instead of the northerly winds, may greatly contribute to the improvement of the general health.

A little boy, born of poor, but robust parents,

was badly fed, and scarcely clothed; yet the child grew well, and was strong and healthy: he lived in a large airy house, of which his mother had the care, until he was four years old, when her services were no longer required, and she sought another habitation. The new abode was a garret, with a small sky-light: while the fine weather continued, the playful child amused himself in the open air, but winter came on, the boy was compelled to remain in doors; his rosy cheeks grew pale, his sprightliness disappeared, he fell away, and but for the return of spring, and his naturally strong constitution, he would probably have fallen a victim to want of good air. Three other children were born in this wretched garret; the youngest died when five months old; the two others are scrofulous, and have been since their infancy, affected with opthalmia. The mother, fortunately, found employment in a healthy part of the country; enjoyed the comforts of her new situation; her children worked in the fields; the eldest regained all his strength, and the younger boys gradually improved.

Atmospheric influence will be found of the greatest advantage in the education of children; they require freedom of action, good nourishment, light air, and change of scene. Some parents and governesses are in the habit of confining children for several hours in the same apartment; from whatever cause this conduct originates, it

is greatly to be deplored; it is laying the foundation of a multitude of evils that may in later life be difficult, if not impossible, to remove. Children are frequently taken to the sea-side, for the benefit of their health, and instead of being allowed as much exercise as requisite, are shut up in a small school room or nursery, for many consecutive hours; which confinement must be detrimental to their bodily improvement.

One of the most striking characteristics in childhood is the love of variety; it is innate in the human breast; and the internal thirst for new sensations should be regulated, not suppressed. The choicest blessing bestowed by the Almighty on man, is health; let it be our constant study to preserve the inestimable treasure. To this great end, we cannot more effectually contribute, than by giving a due share of attention to the action of physical agents on the human economy.

If a remarkable instance be sought of the effects and misapplication of all the powers of physical education, it will be found in the melancholy relation of the life of Gaspar Hauser.

CHAP XV.

Gaspar Hauser.

It is reported that an enthusiastic painter, who delighted in his profession, put a man to the torture, to obtain the expression of real suffering. Had any hard-hearted individual, for the selfish interest of science, endeavoured to obtain a fit subject to solve a problem of education, he could but have imitated the barbarian who confined Gaspar Hauser eighteen years in a narrow cell, and then cast him on the wide world, unprotected from the influence of physical agents, and the evils of society.

The new-born babe cannot express its feelings; a child is accustomed to the influence of physical agents before he acquires the power of speech. Gaspar Hauser was thrown upon the world eighteen years after birth; he was born, we may say, not an infant, but a man; and a more favourable subject for the application of a system of education could not possibly be found.

Whether we admit, with Aristotle and Locke, that the human mind is like a blank sheet of paper, on which any impression may be made; or, that we argue with Plato and Descartes, that principles and ideas are innate; in both cases, the power of education must be admitted: as in the first instance, education gives the ideas; in

the second, it develops them. Without adopting exclusively, either of these theories, but having opinions which appear to us stamped with the character of truth, we remark great natural aptitude in children, merely requiring development; and, in applying a system of education, we think that it must not only be adapted to the general character of youth, so powerfully influenced by external sensations, but to the individual capacity and natural disposition of each child.

Putting aside all the mystery which surrounds the life of Gaspar Hauser, we shall only refer to those incidents that serve to demonstrate the advantages of well directed physical and intellectual education. The errors committed in Gaspar Hauser's life, will serve as a warning to others; and we shall endeavour to make his misfortunes useful.

On the 26th of May, 1828, a citizen, residing near Nuremburg, perceived, at some distance from his house, a young man, dressed as a peasant, in an extraordinary position; he was like a drunken man striving to walk, but unable to keep himself upright; tears ran down his face, he seemed to be suffering from hunger, thirst, and pains in his feet. He heard, but could not understand what was said; he was not blind, his eyes were open, yet he could not see; he moved his feet, but could not walk; his only language consisted in tears and groans,

and unintelligible sounds. He displayed neither fear nor astonishment; he seemed oppressed with care, and indifferent to all surrounding objects; he could not reply to any questions; knew not where he was, nor from whence he came.

It was afterwards ascertained, that this young man had been confined for sixteen or eighteen years, fed on bread and water, and holding no communication with any human being; he had not even seen his goaler, for the food allowed him, was placed in his cell while he was asleep.

Who was this young man? What could be the object in keeping him so long shut up, and what criminal mystery did this sort of idiot, this babe of eighteen, represent? Why feed him on bread and water, deprive him of light, and liberty, and cast him alone on a public road, where, being totally unable to assist himself, he might have perished?

Gaspar Hauser's condition gave rise to a thousand conjectures; formed the general subject of conversation, and all the inhabitants of Nuremburg were anxious to become acquainted with him.

Such an opportunity for physiologists and phylosophers to make a useful essay on a system of education, had, perhaps, never occurred; yet, the crime committed on Gaspar Hauser was not taken advantage of for this purpose. His plaintive cries attracted the notice of the magistrates, he

was adopted by the city, and became the orphan of Nuremburg.

The medical men who were called in, gave it as their opinion, that Gaspar Hauser was in his right senses, that he was not an idiot, but that he was in a state of the deepest ignorance; and to the philosopher and man of the world, he became a subject of serious meditation, and offered a melancholy example of the brutality of an individual being, entirely isolated and deprived of the advantages of education, and of social life. With a human face, Gaspar Hauser was less than a brute; he was less than a monkey, less than a dog, or any other animal guided by instinct: but for the assistance of others, Gaspar Hauser would have perished. Had he been free from his infancy, it may be presumed, that his natural wants would have developed in him the qualities of brutes. He might have lived on vegetables and the flesh of animals, and learnt to seek for prey; exercise would have made him strong and robust; he might have been savage and ferocious, yet supply his own wants. But Gaspar Hauser, closely confined, fed on bread and water, was mild, timid, and inoffensive; he had been so long oppressed, that he had lost all spontaneous power, and was totally void of energy.

Let us now examine in what manner the town of Nuremburg brought up its unfortunate *protegé*; and for the education of children, let us derive a useful lesson, from the cruelty to which Gaspar Hauser was a victim.

Gaspar Hauser was four feet nine inches high; he appeared to be sixteen or eighteen years old; his chin and lips were covered with light down; his wise teeth were not cut: his hair was brown and curly; he was stout, had broad shoulders, and was well made: he was pale, yet did not look sickly; his limbs were delicate, his hands small, and well formed: the soles of his feet had never been covered, and were very soft; there were marks of inoculation on both arms, and on the right arm the mark of a wound recently inflicted.

His countenance was common, and in a state of repose, void of expression; the lower part of his face was rather prominent, which made him look stupid, and he stared vacantly. If he cried, his mouth was distorted, and when he was pleased, he shewed it by a sort of silly smile.

He scarcely knew how to make use of his hands and fingers; and like the child learning to walk, he tottered; he endeavoured to lift both feet at once, not successively; and the least thing made him stumble. His knees were bent, and it was evident he had been used to remain constantly seated.

Accustomed to bread and water, he seemed to have an aversion for any other nourishment; the smell of meat, made him shudder; and if he tasted a drop of wine or coffee, mixed with water, he turned cold, and it brought on vomiting and head ache.

Gaspar Hauser's impressions, carefully studied, might serve as a guide for the education of children at the breast. Instead of being fed with milk, Gaspar Hauser had bread and water, and the sudden change from this simple nourishment to one of a more substantial nature, nearly proved fatal to him.

He was once persuaded to taste brandy; he put the glass to his lips, turned pale, faltered, and would have fallen to the ground, had he not been supported: another day he took a few drops of coffee, he had scarcely swallowed them, when he was seized with violent colics: beer however weak it might be, brought on stomach ache, heat, and profuse perspiration, which terminated in fever and head ache: milk, whether hot or cold, he also disliked: meat was put into a roll, he smelt it immediately, and being induced to eat it, he was taken suddenly ill.

When placed under the care of professor Daumer, he could not partake of the same food as other people; he was, however, induced to take some water gruel, of which he was afterwards very fond. Vegetables and farinaceous preparations agreed with him; before he could eat any thing warm, he was very thirsty, and drank a great quantity of water. A few drops of gravy were occasionally put into his gruel, and a small portion of meat, well cooked, mixed with his bread; the quantity was gradually increased, and he thus learnt to take animal food.

The care that should be taken to give proper food to infants, and the attention to be paid to suit their nourishment to the strength of their digestive powers, the gradation in the change of living, the prohibition of liquors of every kind, could not find a stronger or more powerful confirmation, than that demonstrated by the feelings of Gaspar Hauser.

Is it surprising that so many children die of convulsions, if we reflect on the fatal carelessness or ignorance of parents, to which so many infants are victims? Improper food and beverage are administered to babes, and the poison is offered by the maternal hand, or by ignorant and obstinate nurses.

Can we wonder if such a vast number of children are carried off, shortly after they are weaned, when unable to support the sudden change of nourishment, and no care has been taken to suit it gradually to the powers of the digestive functions?

All persons feeling an interest in the physical education of children, will find that the effect of animal food on Gaspar Hauser, merits considerable attention.

When Gaspar Hauser became accustomed to eating meat, his intellectual faculties decreased; his eyes lost their brilliancy and expression; he was less active, and perfect indifference and inattention were substituted for the application he had shewn: he also understood what was

said to him less speedily. Such was the effect of animal food, in a case where the digestive powers concentrated on the stomach, deprived the brain of its excitement.

There is every reason to give credence to this fact, if we reflect on the advantages derived in convents from light or vegetable diet. The stomach, overloaded, or containing food hard of digestion, benumbs the brain, renders it unfit to receive external impressions with clearness, and the mind has no longer the same discerning powers. Great eaters are mostly poor thinkers; children and old men sleep when they have taken large quantities of food.

If Gaspar Hauser's brain felt the influence of too powerful nourishment, and lost its energy and strength, his body increased considerably in size, as if to compensate for the diminution of mental power: after taking animal food for a few weeks, he grew more than two inches.

If children's stomachs demand a species of education; if they must be gradually accustomed to the use of different aliments; the senses also require to be educated; for if children learn to taste, and digest, they also learn to see, to hear, to feel, to touch, to speak; and though Gaspar Hauser was eighteen, he had to be educated as a child at the breast.

New born infants sleep and eat; Gaspar Hauser thus spent eighteen years of his life: but as soon as he found himself among his fellow

creatures; as soon as his senses were struck by surrounding objects, he felt as all children do, and his attention was drawn to every thing that was brilliant.

It is said that a child's first love is a lighted candle; when Gaspar Hauser first saw one, he could not take his eyes from it: if the candle was moved, he followed it, took hold of it, and burnt his fingers.

At eighteen years of age, Gaspar Hauser had no idea of distances; looking from the window of the tower in which he was placed, at Nuremburg, he mistook the trees for window shutters, which prevented him seeing farther; he tried to touch things that were at a considerable distance, and could not distinguish real objects from those that were painted.

Notwithstanding Gaspar Hauser's admiration of light, his eyes were affected by it; but the time he had passed in darkness had developed the faculty of sight, and during the night, Gaspar Hauser could distinguish different objects without any artificial light: he could see less in broad day light than at any other time.

Soon after he had commenced his education, he read late in the evening, when no one else could see; he pointed out to his tutor a fly in a spider's web, which he alone could discern at so great a distance. He distinguished colours during the night, and when only three or four stars were visible to the naked eye,

Gaspar Hauser plainly saw whole groups. This faculty of seeing in the dark, was but the result of the exercise of sight he was compelled to make, during the many years he had been bebarred from light; and the organ of sight had been extended by the necessity of catching the rays of light, which occasionally gleamed in his cell; but when free, he found the light was so powerful, that he continually kept his hands before his eyes till he gradually became accustomed to it.

His sense of hearing was equally acute; he had lived in such perfect repose, that the sound of the human voice made him startle. Wanswietten had forbidden the cannon to be fired near the royal palaces, after the birth of a prince; he thought the noise might affect the infant's brain; but what the newly-born babe could not give utterance to, Gaspar Hauser felt, and expressed. At a later period, the human voice made his head ache; the sound of a bell, or striking of a clock, nearly threw him into convulsions, and when these ceased, he remained in a state of stupor. It was some time ere these sounds reached his intelligence, and awakened his attention: when the clock struck Gaspar Hauser fell into a state of deep meditation.

A few weeks after his arrival at Nuremburg, a wedding passed under the window of his tower, accompanied by a band of music. Gaspar Hauser was motionless; he seemed transformed

into a statue; his eyes and ears appeared to follow the musical sounds, when at a great distance: it was no longer heard, and he yet sought to catch the last vibrations of the pleasing sounds, as though his soul could reach this celestial harmony.

Being one day taken to a military parade, Gaspar Hauser was so near the great drum, and so terrified at the noise, that he fell into convulsions, and was carried back to his tower. The celebrated Wanswietten, judiciously recommended, that children should be kept from great noise, as the brain might be so strongly affected by it, as to bring on idiotcy.

Gaspar Hauser complained so bitterly of noise, that he sometimes regretted his solitary cell. The sense of smelling was very acute: what other people could only smell near them, Gaspar Hauser smelt at a very great distance.

All medical men, who have given their attention to the physical education of children, have strenuously recommended that they should not be allowed to remain in apartments where the smell of flowers, or any other odour, could affect them. The experiment made on Gaspar Hauser, shews the propriety of this advice; the only smell he could bear, was that of bread, fennel, and aniseed: he disliked walking; the scent of the trees and plants brought on fever: he could distinguish a pear tree from an apple

tree, or plum tree, merely by smelling the leaves. The varnish on paintings, and even the ink he used, affected him painfully; if a cheese were placed near him, he was sick; vinegar had the same effect, and wine was not less disagreeble. Odours, that are generally considered bad, were to him more bearable; raw meat had a smell that he found horrible.

Walking with Professor Daumer, near a church-yard, he was so powerfully affected, by the smell of the dead, that he was seized with fever, and shivering fits, which at the time, his companion was unable to account for, and he did not perceive any particular smell; this fever was succeeded by violent perspiration; he complained greatly of intense heat, and his sight was affected.

This sensitiveness of Gaspar Hauser, is most fertile in instruction; we are not always ready to acknowledge the influence of the emanations of the earth, covered with the remains of vegetable and animal matter; we often think the cause of our sufferings far distant, while it is in the impure air we breathe. Persons who remain confined in the same apartment, and seek to avoid the effects of physical agents, are immediately affected, if they are near any place where the air is impure. How often have those who followed their friends to their last abode, been seized on the borders of the grave with a

disease occasioned by the impurity of the air, which has ceased to have an effect on grave-diggers, accustomed to live in an atmosphere impregnated with miasms, and to be constantly among the remains of human beings!

Is it surprising that children should be so subject to disease, when the air is loaded with miasm, and acting so powerfully on youthful organizations?

Gaspar Hauser having lived so long away from the deleterious influence of the air, was unprotected from the miasms emanating from putrified bodies. All the senses that had not been exercised, caused him great pain, whenever they were brought into action: if the touch was to correct the errors of the sight, it was by painful experience; for instance, he put his fingers into the flame of a candle, and burnt them; he touched the snow, and appeared to suffer from the cold; he sought to reach the steeple of a church, and made great efforts to attain it. He had no knowledge of distances, and his total ignorance of optical laws, and perspective often misled him; he could not understand why trees at the end of an avenue appeared smaller than the others; when he came near these trees, he touched them, and examined them most carefully: as in children, the touch rectified the errors of sight.

On his arrival at Nuremburg, the inhabitants seemed to take great interest in Gaspar Hauser;

and hearing that he was in a state of childishness, they gave him various playthings; and as he could not speak, or understand what was said to him, he was greatly taken up with his playthings, which furnished him with new ideas: the wooden horses pleased him very much, but as his intelligence was developed, he cared less for toys, and seemed anxious to learn and communicate with others.

He learnt to speak like young children; first naming the objects before him; conjunctions, prepositions, and pronouns, were not known to him: he said 'Gaspar very well'; 'Gaspar, good boy'; always speaking of himself in the third person.

An individual, who like limself, had spent his childhood and infancy in a dungeon, in which fresh air scarcely ever penetrated, must necessarily be very sensitive, and suffer considerably from changes of temperature: during a storm, all his limbs were convulsed; he trembled, and shuddered; his limbs were relaxed, and he felt pressure on his head: while the storm lasted, he remained in this state; the lightening hurt his eyes; he felt a pricking sensation, which lasted about half an hour, then his nose bled, and he was relieved. He could tell how long a storm would last; if it was to be long, his hands and feet were cold; this extreme sensibility diminished as he became more accustomed to live with his fellow creatures.

Gaspar Hauser nearly fell a victim to his strong and numerous sensations. After being confined and left quite alone so many years, he was suddenly overwhelmed by so many different feelings; by the influence of the air, light, and many surrounding objects; by his desire to learn; change of food, habits of life, and his intellectual and rapid development.

The action of so many divers causes might powerfully influence, and even injure the health of individuals gifted with less sensitiveness than Gaspar Hauser. After the town of Nuremburg had adopted him, no day passed without his receiving a number of visits from persons who fatigued him with questions. It is true that his intelligence might be exercised by these inquiries; but what a strange contrast in the scenes he witnessed! and what could result from the multitude of sensations succeeding each other so rapidly? If his memory was loaded, it is certain his ideas could not be clear. Gaspar Hauser's mind was more exercised than his body; a thousand novel impressions reached his infantine brain, and a sudden illness might naturally be expected to destroy the fabric formed on so weak a foundation.

In less than twelve months, Gaspar Hauser had learnt to eat, to see, to feel, to hear, to taste, to touch; he had scarcely made any physical progress, before every thing was done to develop

his mental powers; his preceptor sought to make him think as a man, act as a man, speak as a man; while he had all the weakness and inexperience of a child.

Gaspar Hauser soon fell sick; his medical attendant was struck by the rapid change that took place; he was melancholy and weak, and his nervous excitation morbid; the muscles of his face contracted, his hands trembled; his eyes were inflamed, and unable to bear the light; his hearing was so acute, that even a whisper was painful to him; he could not bear the sound of music, of which he had been so passionately fond; he lost his appetite, the digestive functions were impaired, he complained of pain, and grew worse and worse.

When he recovered his functions, aware of the danger of excess of mental exertion, and finding his intellectual education had been too much forced, they placed him under the care of Mr. Daumer, a gymnastic master; this precautionary measure saved Gaspar Hauser's life; he was relieved from visits, questions, and the various inquiries which, though an useful exercise to the mind, were beyond his powers of attention, destroyed his repose, and kept him in a state of continual excitation.

Gaspar Hauser's life is fraught with instruction; it is a microscope displaying all the errors of general education. Gaspar Hauser was treated as most children are; his mind was

cultivated at the expense of his health. However delicate the infant brain may be, every thing is done to force it in the hot-bed of education, without considering whether the body will be able to assist the cerebral organ; no attention is paid to the results; an edifice is constructed, a pyramid is built, with the summit for a foundation.

Instead of taking means to strengthen and fortify Gaspar Hauser's body, and enable him to resist the surrounding influence; the chief aim had been to make him a thinking man; but at the least change of temperature, or storm, the poor creature trembled from head to foot; the slightest excitement brought on fever. What man, with trembling limbs, convulsive muscles, could exert his reasoning powers, when the mere name of education made him almost regret his lonely cell, and bread and water?

How many females bring themselves to the same physical state as Gaspar Hauser! excluding themselves from the beneficial influence of physical agents, they suffer from the least change of temperature; head ache, debility, langour, nervousness, paleness, imperfect digestion, and morbid excitation: such are the sad privileges of the fashionable world; and of those young girls, whose minds are developed at the expense of their bodies.

As soon as Gaspar Hauser was placed under

Mr. Daumer's care, every attention was paid to his bodily organs, and his mental faculties were not over excited; he recovered his health, became strong and dexterous; he could manage the wildest horse; his courage and boldness created general surprise.

When he arrived at Nuremburg, his brutal and stupid countenance, his mournful cries and lamentations, created pity and disgust; but as his mind and body were exercised, and his education was harmonized, his features became more regular. On his countenance was depicted the mildness of childhood, and his manly features bore an air of sadness: it would have been difficult precisely to state his age.

It is an observation worthy of the attention of philosophers and parents, that regularity in actions and ideas, gives a stamp to the countenance, and harmonizes the features; there is no real beauty without harmony—that admirable concensus of all parts of the body; and physiognomists have correctly observed, that physical irregularity might be considered as an indication of moral irregularity. There is a continual relation between the body and mind; slavery, vice, and ignorance brutalize the features; virtue, independence, and knowledge ennoble them. How hideous is the countenance of an ignorant, vicious man; how admirable is that of an honest man, enlightened by knowledge and science!

Gaspar Hauser, at two different periods of his life, presented these different aspects. Stamped with the character of brutality, when he reached Nuremburg, and later on, with intellect. Gaspar Hauser, however, did not live long enough to enjoy his independence, and hold himself erect.

It was found very difficult to convey religious instruction to his mind; for though he had sufficient intelligence to understand the existence of matter, which he could see and feel; he could not elevate his mind to the sublimity of the divinity. This unhappy young man, who believed that whatever moved, had life, could not believe in what he did not see; he was unable to raise his thoughts to the Supreme Being, and thus reach the source of all things. He was in a state of ecstasy when he saw the sky and stars; and the natural questions,—who made the beautiful stars? —who fixed them in the heavens?—what gives them so much brilliancy?—enabled Professor Daumer to convey to his pupil's mind the first ideas of the Divinity. Gaspar Hauser humbled himself before the throne of God, as the savage adores, without understanding; and learns to know his Creator in admiring his works. *Coeli enarrant Gloriam dei!*

What Gaspar Hauser most required, was an able preceptor, who would not give him a common education, but would adapt it to his age, his senses, his ignorance. What an excellent opportunity for the application of a system! Was

it not Condillac's statue, to which the philosopher lent ideas as he gave the use of a sense!

When Gaspar Hauser was confided to Mr. Daumer's care, he was at first more like a brute than a human being; but through Mr. Daumer's judicious management, he soon made rapid progress, and was enabled to derive the advantage of a well directed education.

It is worthy of remark, that as the exercise of his faculties were regulated, he lost some of his most striking privileges; his memory was less powerful, his feelings less acute. He now began to enjoy life; he had not yet been made to go through the routine of Latin and Greek, which was to confine his mind in a narrow circle, as his body had been confined in a cage. But Gaspar Hauser had acquired the most important parts of education; he had learnt to read and write; he could even put down his own recollections; and it is not the least interesting part of his life, to learn from his own pen, what had passed at his arrival at Nuremburg.

But previous to that arrival, according to the narration of Anselm von Feuerbach, President of one of the Baravian Courts of Appeal;—"It was only at Nuremburg that he came into the world.* Here he first learnt that, besides himself and 'the

* An expression which he often uses to designate his exposure in Nuremburg, and his first awakening to the consciousness of mental life.

man with whom he had always been,' there existed other men and other creatures. As long as he can recollect, he had always lived in a hole (a small low apartment, which he sometimes calls a cage,) where he had always sat upon the ground, with bare feet, and clothed only with a shirt and a pair of breeches. In his apartment he never heard a sound, whether produced by a man, by an animal, or by any thing else. He never saw the heavens, nor did there ever appear a brightening (daylight) such as at Nuremburg. He never perceived any difference between day and night, and much less did he ever get a sight of the beautiful lights in the heavens. Whenever he awoke from sleep, he found a loaf of bread and a pitcher of water by him. Sometimes this water had a bad taste; whenever this was the case he could no longer keep his eyes open, but was compelled to fall asleep; and when afterwards he awoke, he found that he had a clean shirt on, and that his nails had been cut. He never saw the face of the man who brought him his meat and drink. In his hole, he had two wooden horses and several ribbons. With these horses he had always amused himself as long as he was awake; and his only occupation was, to make them run by his side, and to fix or tie the ribbons about them in different positions. Thus, one day had passed as the other; but he had never felt the want of anything, had never been sick, and —once only excepted—had never felt the sens-

ation of pain. Upon the whole he had been much happier there than in the world, where he was obliged to suffer so much. How long he had continued to live in this situation he knew not; for he had no knowledge of time. He knew not when, or how he came hither. Nor had he any recollection of ever having been in a different situation, or in any other than in that place. 'The man with whom he had always been,' never did him any harm. Yet one day, shortly before he was taken away—when he had been running his horse too hard, and had made too much noise, the man came and struck him upon his arm with a stick, or with a piece of wood; this caused the wound which he brought with him to Nuremburg.

"Pretty nearly about the same time, the man once came into his prison, placed a small table over his feet, and spread something white upon it, which he now knows to have been paper; he then came behind him, so as not to be seen by him, took hold of his hand, and moved it backwards and forwards on the paper, with a thing (a lead pencil) which he had stuck between his fingers. He (Hauser) was then ignorant of what it was; but he was mightily pleased when he saw the black figures which began to appear upon the white paper. When he felt that his hand was free, and the man was gone from him, he was so much pleased with his new discovery, that he could never grow tired of drawing these

figures repeatedly upon the paper. This occupation made him almost neglect his horses, although he did not know what those characters signified. The man repeated his visits in the same manner several times.*

"Another time the man came again, lifted him from the place where he lay, placed him on his

* Of the fact that Gaspar really had had instruction, and, indeed, regular elementary instruction in writing, he gave evident proofs immediately on the first morning after his arrival in Nuremburg. When the prison-keeper, Hiltel, came to him that morning in the prison, he gave him, in order to employ or to amuse him, a sheet of paper with a lead pencil. Gaspar seized eagerly on both, placed the paper upon the bench, and began and continued to write, without intermission, and without ever looking up, or suffering himself to be disturbed by anything that passed, until he had filled the whole folio sheet, on all four sides, with his writing. The appearance of this sheet, which has been preserved and affixed to the documents furnished by the police, is much the same as if Gaspar, who nevertheless wrote from memory, had a copy lying before him, such as are commonly set before children when they are first taught to write. For the writing upon this sheet consisted of rows of letters, or rows of syllables, so that almost everywhere, the same letter or the same syllable is constantly repeated. At the bottom of each page, all the letters of the alphabet are also placed together, in the same order in which they actually succeed each other, as is commonly the case in copies given to children: and, in another line, the numerical cyphers are placed, from 1 to 0, in their proper order. On one page of this sheet the name of "Kaspar Hauser" is constantly repeated; and on the same sheet, the word reider (Renter, rider) frequently occurs, yet this sheet also proves that Gaspar had not advanced beyond the first elements of writing.

feet, and endeavoured to teach him to stand. This he repeated at several different times. The manner in which he effected this was the following: he seized him firmly around the breast from behind; placed his feet behind Gaspar's feet, and lifted them, as in stepping forward.

"Finally, the man appeared once again, placed Gaspar's hands over his shoulders, tied them fast, and thus carried him on his back out of the prison. He was carried up (or down) a hill.* He knows not how he felt: all became night, and he was laid upon his back." This "becoming night," as appeared on many different occasions at Nuremburg, signified in Gaspar's language, "to faint away." The account given of the continuation of his journey, is principally confined to the following particulars: "that he had often lain with his face to the ground, in which cases it became night; that he had several times eaten bread and drunk water; that 'the man with whom he had always been,' had often taken pains to teach him to walk, which always

* It is evident, and other circumstances prove it to be a fact, that Gaspar could not at that time yet distinguish the motion of ascending from that of descending, or height from depth, even as to the impressions made upon his own feelings; and that he was consequently still less able to designate this difference correctly by means of words. What Gaspar calls a hill, must, in all probability, have been a flight of stairs. Gaspar also thinks he can recollect that, in being carried, he brushed against something by his side.

gave him great pain," &c. This man never spoke to him, excepting that he continually repeated to him the words, "Reuta wähn," &c.* He (Gaspar) never saw the face of the man either on this journey or ever before in prison. Whenever he led him, he directed him to look down upon the ground and at his feet,—an injunction which he always strictly obeyed, partly from fear, and partly because his attention was sufficiently occupied with his own person and the position of his feet. Not long before he was observed at Nuremburg, the man had put the clothes upon him which he then wore.

The putting on of his boots gave him great pain; for the man made him sit on the ground, seized him from behind, drew his feet up, and thus forced them into the boots. They then proceeded onwards still more miserably than bebefore. He neither then, nor ever before, perceived anything of the objects around him; he neither observed nor saw them; and therefore he could not tell from what part of the country, in what direction, or by which way he came. All that he was conscious of was, that the man who had been leading him, put the letter which he had brought with him into his hand, and then vanished; after which a citizen observed him and took him to the guard-room

* This jargon seems to imply, "I will be a rider (a trooper) as my father was."

at the New-gate. The history of the mysterious imprisonment and exposure of a young man, presents, not only a fearful, but a most singular and obscure enigma, which may indeed give rise to innumerable questions and conjectures, but in respect to which, little can be said with certainty; and until its solution shall have been found, it must continue a mystery.

Gaspar's mental condition during his dungeon-life, must have been that of a human being, immersed in his infancy in a profound sleep, in which he was not conscious even of a dream, or at least of any succession of dreams. He had continued in this stupor until, affrighted with pain and apprehensions, he suddenly awoke, stunned with the wild and confused noises, and the unintelligible impressions of a variegated world, without knowing what had happened. Whoever should expect that such a being, when arrived at a full state of consciousness, should be able to give a perfectly clear and circumstantial historical description of his slumbers and his dreams, which should satisfy the understanding, so as to remove every doubt, would expect nothing less than an impossibility.

Gaspar Hauser's own narration was as follows:—

"I stood a long time in the above-mentioned place in which the man* had left me, until the

* The unknown who had brought him into the city.

other man* took my letter, and conducted me to the house of the commandant. When I came to the house, I felt, from the loud voices which I heard, violent pains in my head. The officers placed me on a stool†, but I could not answer with any words but those which I had learned, and these I made use of, without any distinction, to express fatigue and pain: thereupon he brought me a pewter plate with some meat, and beer in a glass. The brightness of the pewter, and the colour of the beer, pleased me, but soon the smell of the beer gave me pain; I thrust it away. He wished to force me, but I always pushed it back. Then he brought me some water, and a piece of bread, which I knew again immediately, and took it in my hand, and ate and drank.

"The water was so fresh and good, that I drank three or four glasses of it, and felt myself quite strengthened. Then he laid me in the stable, and I fell asleep as soon as I was in it. When the commandant came home, I was awakened. I saw his uniform and his sword. I was astonished and delighted with it,

* The citizen who found him in the place where his unknown conductor had left him.

† Hauser can only recollect that the officer spoke to him, and that he wished to interrogate him; which was undoubtedly the case.

and wished to have such a one. They began to speak, and so loud, that it gave me pain in my whole body. I began to cry. Then they took me to the police, and that was my most painful walk. When I came thither, there were very many men there; I was astonished, and knew not what that was that made them speak so continually, and so loud: then they gave me snuff, which I was obliged to put into my nose, and that made me very ill, and I began to cry, as I felt frightful pain in my head. They teazed me also with all sorts of things, which caused me shocking pain, and I continued to weep on. When I had been a considerable time with the police, they brought me to the Tower. I was obliged to go up a very high hill, and wept, as everything had done me great hurt. When I came to the Tower, one man spoke again so loud, that I felt still more pain: the same man made me go up another high hill, that is, the staircase; he opened the door, which made a great noise, and then first could I take rest. But I wept still a long time, until I became sleepy, as everything gave me pain: at last, however, I fell asleep; when I heard something at which I was so amazed, and I listened to it with such attention, as in my former situation I had never heard anything like it. This attention I cannot indeed describe. I listened very long, but when, after some time, I heard

nothing more, and my attention ceased, I felt a pain in my feet. I remarked that I felt no pain in my eyes, and I knew not why. It was not become day, which was of the greatest benefit to my eyes. But in other respects I felt pain in my whole body, especially in my feet. I sat up, I wished to quench my thirst with the water that stood near me, for which I felt. I saw no more water and bread, instead of which I saw the floor, which had appeared quite different in my former dwelling place. I wished also to look about for my horses and play, but they were not there. Hereupon I remarked the sack of straw on which I sat. I examined it with great astonishment, and I knew not what it was. When I had considered it a very long time, I beat it with my fingers, by which means I heard the same sound as from the straw in my former dwelling place, on which I always used to sit and also sleep. I saw also many other things of which I fell into astonishment, and which cannot be described. I again heard the clock strike; I listened very long, but I heard it no more. I saw the stove, which was of a green colour, and brightness proceeded from it. Upon this also I said the words, which the man had taught me. I said it several times, but I received nothing. I looked at it very long. I said once again the same words; by which I meant to say to the stove, that my horses should not be so long in coming.

I had a notion that the horses were gone away. I also had the thought when the horses came, to say, They shall go away no more. This also would I have said, No more they shall leave the bread, otherwise they have nothing. With so much speaking I felt great thirst, and as I no longer saw any water, I lay down and slept: when I awoke again, I felt again the same pain in my eyes as I had felt in my way towards the city. When I awoke again it was day, and the brightness of day was very painful to me. I began to cry. I heard the same thing as I had heard at first, but I mean, however, that it was somewhat different, as I heard it much louder; it was not the same, but (instead) that the clock struck, it was become sounding. This I listened to a very long while; but when from time to time I heard it continually less and less, and my attention was at an end. I lay a long while; the man lifted me up no longer, I sat up by myself. I remarked that I was in the same place; then thought I likewise this, that I should feel no longer any pain in my eyes, and hear the same thing. At length I stood up; I also set myself down again, as my feet gave me very great pain. I began to weep again, and said the words which I had learned, by which I meant, Why are the horses so long without coming, and let me suffer so much? I wept a very long time, and the man came no more. I heard the clock strike; this always

took away half of my pain, and on which the thought comforted me, that now the horses will soon come. And during this time, as I listened, a man came to me, and asked me all manner of things; perhaps I gave him no answer, as my attention was turned towards what I heard. He seized me by the chin, and lifted up my head, by which means I felt a frightful pain in my eyes from the day-light. The man of whom I now speak, was he that was shut up with me, therefore I did not know that I was shut up. He began to speak to me; I listened to him a very long time, and constantly heard other words; then I said to him my words already mentioned. But he had not understood me in what I said; he had well understood what the words signified, but not what I meant. He let my head go, seated himself near me, and continually asked me questions. In the meanwhile, the clock began to strike. I had my attention turned towards that the instant I heard it; I must long have listened to the man; he took me by the chin, turned my face towards him, and would again have asked me* what I listened to so attentively, but I understood him not in what he had said. He continued to speak, however: I began to weep. He stood up, went away to where he lay, and

* Instead of "he may have asked me," probably, he asked me.

left me to sit alone. I wept a very long while; I felt great pain in my eyes, so that I could not weep any longer. I sat alone a very long time, then I heard something quite different, upon which I listened with such an attention as I cannot tell. What I heard was the trumpet in the Emperor's stable; but I heard not this long. Then the man came to me here, and said several times the words which he had spoken before very slowly at first, and I said after him; he said, Dost thou not know what this is? I said these words to him several times. The man now stretched out his hand towards the water pitcher, which stood under my bed, and wanted to drink, but I stretched out my hand towards it. The man gave me the pitcher forthwith, and let me drink; when I had drank the water, I became so lively as cannot be described. Just then the clock began to strike, which delighted me exceedingly, so that I always forgot my pain, and my longing was after this dwelling place.* Just then, *Hiltel*, the keeper of the prison, came, and brought the bread and water, which I knew again immediately. He laid the bread down by me; I also took it up in my hand immediately; he poured the water into the pitcher, and set it down upon the floor. Just then he began to ask me questions. He questioned me with so harsh a voice, that it

* Must be understood, *and I lost* the longing which I had after my former dwelling place.

caused me much pain in my head. The keeper of the prison went out, as he had not understood me; he knew the words well, as to what they meant, but not what I had wished to express by them, and I also understood not what he had said to me. I ate my bread as soon as I had brought it to my mouth; it was not so hard as what I had eaten in my former dwelling-place.* I handled it, and saw that it still was bread; it had the taste, but not the hardness.† I ate it, however, as I was hungry. When I had had it a few minutes in my stomach, I felt great pain in my body. I began to cry. Again, I heard the trumpet in the Emperor's stables. I listened, and was constantly delighted greatly, as it was my hope, that when the horses come, I tell them‡ what I have heard. I listened a very long time; I heard nothing more. Then came the keeper of the prison back again, and brought with him a piece of paper and a lead pencil. I knew this again immediately, at which I was so delighted that I cannot describe it, as I thought now I

* His usual food was fine high-spiced rye-bread.

† In his place of confinement he had bread quite stale, and therefore he could the less endure the newly-baked bread which he had in the Tower.

‡ When Hauser expressed words and thoughts by himself, in the earliest part of his residence in Nuremberg, he made use of inaccurate modes of expression in what he said at that time. Thus, he says, "I tell" with the suppression of "shall," or "will."

should soon receive my horses.* He gave me the paper and the lead pencil in my hand, and I wrote what he now had taught me, and this was my name, but I have not known what I have written."

However enlightened may have been the care which Professor Daumer bestowed on his pupil, he could not entirely eradicate false ideas. Gaspar Hauser had received so many visits, been so much questioned, and so often told he was an extraordinary being, that his vanity was kindled. It is not said whether the organ of self-esteem was strongly marked, but he began to think a great deal of himself, and having observed the effect he produced on his visitors, when he related any thing extraordinary, ceased to confine himself to truth. He contracted the moral vices of modern education, —of that superficial education, unenlightened by reason,—of that imperfect education, which teaches evil as well as good; because men will not be persuaded that children are mostly influenced by example.

A noble Englishman took Gaspar Hauser

* In his dungeon, he had written with a pencil on paper, therefore he associated the sight of those objects with the idea of his horses which he had there, and meant, that as the former were at hand, the latter were not far off, as they were all connected together.

under his protection, and placed him with a tutor at Anspach, from whence it issupposed he came. It can scarcely be doubted, that this unfortunate young man was the victim of injustice: his life and death are problems still unsolved. No one has yet discovered the secret of his birth, the cause of his imprisonment, or death. His assassination affords another lesson: although he was more robust, and from leading an active life, had acquired strength, yet he remained timid and fearful. The recollection of his prison, weighed on his mind when he was free; the seeds of courage had been early destroyed. Gaspar Hauser could break in a horse, but trembled before his fellow creature; he was unable to protect himself; he had not sufficient confidence to repel an aggressor; he was incapable of self-defence; he never acquired that independent spirit, which characterizes children who are left at liberty in very early life; all his qualities were those of a slave. With such an example before us as Gaspar Hauser, can we doubt the powerful influence of the moral and physical education of childhood on the whole life of a man?

When under Lord Stanhope's protection, Gaspar Hauser received a different species of education; he was suddenly to be converted into a nobleman. At a more distant period,

Lord Stanhope supposed his protegé to be the son of a tailor or glove-maker, belonging to a small village in Austria; yet he was taught Greek and Latin, for which studies he always evinced the greatest aversion; and because he did not suddenly become a brilliant scholar, his patron was disappointed. His preceptors did not follow the progressive steps necessary for the education of such an individual.

We will not here inquire, whether Lord Stanhope was correct in the opinion he formed of Gaspar Hauser; but if he was only the son of a tailor or glove-maker, we must confess it appears strange, that a person in his situation of of life, should have had so deep a physiological knowledge, as to be able to describe the varied sensations felt under different circumstances, with the exactness of the most learned naturalist; he must indeed have been clever, to bring on fever at command, to feel at a distance, and by atmospheric influence! Whether Hauser was a tailor, according to Lord Stanhope, or the son of a prince, as Von Fuerback asserts, it is undoubted that he offers the most striking examples of the power of education; and it is also certain, that his Lordship did not understand the importance of his charge in the cause of humanity.

The short life of Gaspar Hauser, was terminated on the 17th of December, 1833, by the dagger of an unknown assassin; though there is little room to doubt that it was the

same individual who made an unsuccessful attempt in the October of 1829. The following statement of the particulars of his death are given in the German papers:

Gaspar lived at Anspach, and Lord Stanhope during his stay there, had provided for his support. The president of the Court of Appeal had also given him employment in the Registrar Office. On his return from the Courts at mid-day, he was accosted in the streets by a person who promised to impart to him some highly important communications, and he appointed a meeting in the Castle Park. Instead of informing his friends of the circumstance, Hauser remained silent, and went, about three o'clock, to the place of assignation. The stranger, who was waiting for him, took him aside, and suddenly with a dagger, inflicted upon him a mortal wound. In half an hour after he left his home, Hauser returned, almost breathless, and rushed into the apartment of his tutor, but was only able to utter at intervals, the words "Parc—bourse—Uz—monument, and almost immediately fainted; it was not till then that his tutor discovered that he was wounded. He promptly sent a soldier of the police to the Castle Park, who found no one, but near the monument of the poet Uz, he picked up a small lady's work bag, made of violet-coloured silk, containing a paper, on which was written the following words, but so crossed that it was

found necessary to hold it up to the window to read them:

"Hauser will be able to tell very distinctly how I have acted and whence I came. To save Hauser the trouble I tell you myself whence I came; I come from the Bavarian frontier..... upon the river of ..... I will tell you even more, the name M. I. O."

Hauser was struck with terror, and was able to give to the police only a few particulars of the description of the assassin.

Thus has terminated the existence of a man whose life and death have been equally unfortunate.

The history of Hauser is one of the most singular events of our time, and perhaps more mysterious than that of the man with the iron mask. It may be conceived that the policy of a despot might have an interest in the concealment of an important personage; but what interest could it have in bringing up in complete isolation an infant—in making it a prisoner, during the whole of its infancy, in the hands of a gaoler, and afterwards abandoning it to public charity—and, finally, to cause its assassination? How can there exist, in our age, a monster capable of such a refinement of cruelty?

What is scarcely less strange is that the Bavarian police, which is so vigilant on other, perhaps less important, occasions, has not been yet able to discover the least trace of the

wretches who have several times attempted the life of this poor young man, and who have at last accomplished their abominable purpose.

The chief Burghermaster of Nuremburg has caused the following notice, on the subject of this catastrophe, to be inserted in the journals of Bavaria:—

"Caspar Hauser, my dear pupil, is no more. He died yesterday, at ten o'clock at night, at Anspach, from a wound which he received from an assassin The problems which Providence had attached to his melancholy existence are now solved for this victim of the horrible barbarity of his relatives. God, in his justice, will compensate him with an eternal spring of the joys of infancy, which were denied to him, for the vigour of youth of which he was deprived, for the life which has been destroyed only five years after it had begun to be acquainted with human society. Peace to his ashes.

"BINDER, Chief Burghermaster."

"*Nuremberg, Dec.* 18."

BOOK THE SECOND.

PHYSICAL EDUCATION.

CHAP. XVI.

Normal State.

WHAT we have established in the preceding book relates to every sort of education, whether the individual be in the normal state or not. The human frame possesses all the general properties of other bodies; like them, it is subject to the laws of weight, to the influence of light, heat, and damp; and although the laws of life present phenomena of another order, we must nevertheless recognize the importance of physical laws. Every part, every organ of man's body, also possesses its physical properties; the muscles alone are not elastic and extensible, all the organs of the body have this property, are porous, and offer to the external agents which may penetrate them, as many apertures as there are pores; the study and influence of physical agents on the economy, is therefore indispensable, as the element of all physical education.

All existing treatises on the important subject

of Physical Education are adapted for well organized beings; the principles laid down have invariably related to individuals in a normal state: a healthy pupil has been selected, as though it were not necessary to adapt a particular species of education for children well or ill constituted. Physical Education cannot be always the same: if applied to well organized beings, the general rules will be easily established; in the contrary case, there must almost be a peculiar education for each individual. Thus we consider education in two different lights; in the normal and regular state, and in the anormal state. The care children demand before they reach manhood, is almost beyond description. From the moment of their birth, infants require the most assiduous watchfulness, and judicious management; the task of rearing them is attended with continual anxiety, and fraught with innumerable difficulties. When taken from the maternal breast, the change of nourishment may prove injurious to their delicate stomachs. When they learn to walk, with what danger may not a fall be attended! how many anxious moments are passed before they are able to maintain their equilibrium! Children then begin to lisp a few words, how grateful to a mother's ear! yet what patience and perseverance are necessary to make them speak; and how many, many years elapse, ere they can repay the fostering care lavished on them!

In children there are but the seeds of good or

evil qualities; all is inclosed as in the calix of a flower. Strength, courage, dexterity, intelligence, are not apparent at birth, but as growth increases, man expands, is developed; his faculties appear at different epochs of life, and should then be gradually cultivated.

The early part of our existence is marked by a species of increasing perfection; the organs are strengthened, then the functions with which they are so intimately connected. The organs necessary to the preservation of the individual first appear; those destined for the preservation of the human species are later developed.

It would seem at first sight, that this inherent faculty of growth in the infant, should exclude all fear of danger, and that infantine diseases would disappear as each organ is evolved and perfected; which indeed might sometimes be the case, if parents followed the laws of growth, assisted its development when tardy, or arrested its progress if too rapid.

Man grows as a plant, when placed in favorable conditions; but man also, like a plant, may be injured at the root; sap may be wanting, the wind, and storms, may beat down and destroy weak organizations. Give man a shelter against these storms, a support against weakness, uphold the drooping stem; let the nutritious sap be abundant and wholesome; let there be sun, air, and heat.

If man at his birth, be gifted with a strong constitution, it will be naturally well developed,

and each period of life marked by some improvement in the growing organs, which will tend to his normal perfection. As children grow, they are less liable to contract disease, and if the equilibrium of growth be maintained, if due care be taken not to develop any organ prematurely, or one organ to the detriment of the other, every day that passes will add to the chances of life for children.

But if care suffices to ward off various diseases, if children have less to fear from convulsions after teething, and all is regular in the phenomenon of growth, then the children are endowed with good constitutions with normal organizations. In the contrary case, growth increases the chances of illness; children may live a few days longer with care, but cannot pass over a certain period. First teething is to be dreaded for some; for others second teething; then again the period of puberty. To assist regular development, with the aid of physical agents, the primitive constitution must be normal, and no accident arrest growth. Physical agents are the means by which man is normally developed; it is also by the assistance of physical means that the anomalies of organization may be corrected. We repeat, that treatises on education are mostly confined to observations applicable to well constituted persons. For children in a normal or anormal state, the elements of Physical Education we have sketched, are certainly indispensable, and necessary to life. Whether children be

straight or crooked, in order to live, they must breathe and have warmth, light, food, exercise, and shelter from the accidental variations of physical agents; but these agents, so favorable for perfect organizations, require to be modified when nature has been less bountiful. With air, heat, light, food, and exercise, children live and grow, but this does not give the type of their species in all its beauty. Gasper Hauser had the benefit of some of these agents, yet at eighteen he was still a baby.

In the Physical Education of man, as in that of all animals, there is an admirable phenomenon which must not be arrested in its course: man is but sketched at his entrance into life; nature and society continue this admirable work; in the midst of disorder, uncertainty, and obstacles. All authors who have hitherto written on Physical Education, have completely mistaken the importance of *growth*. It is the key of the arch, it is in fact, the most essential part of Physical Education. It is the pivot around which every thing must be placed. For the two systems of normal and anormal education, growth must be carefully watched; regular in the first case, irregular in the second: it is always the expression of health and life in young subjects; it may be termed their vital spark; therefore, before we make the application of the elements we have laid down, we must study the most important phenomenon in human life,—growth, which will be considered in its most striking manifestations,—teething and puberty.

CHAP. XVII.

On Growth.

At his entrance in the world, man is merely sketched; nature and society continue the work already commenced, notwithstanding the obstacles that are to be conquered. Nature is to furnish the first elements of growth, air, light, heat, and food; society has only to leave these agents to take their course, and to assist in improving the object on which they act. The human being existing, his constitution and the elements indispensable to life known, it remains for us to study the phenomenon of growth.

The human embryo generally shews traces of its origin, whether it be favorable or otherwise; but how many accidents and different causes modify this delicate infantine existence! The softness of organism, says Mekel, is remarkable in the early periods of life; it follows that the body is liable to numerous modifications until it reaches that state of maturity and strength, characterized by hardness, and solidity.

The chief function of childhood is to increase and to improve; so that growth is the complicated phenomenon on which the fate of man depends.

We have emitted this proposition, "*growth governs life.*" Neither animals, nor vegetables can attain any degree of perfection, if they receive a check during the phenomenon of growth. Nearly all monstrosities are due to the want of full development in the intra-uterine life. The physiology of animals and vegetables is, in many respects similar; we may therefore without digression remark on their mode of growth.

The sap absorbed by the roots, reaches the foliage, and then returns to the inferior extremities; thus a regular current is established, whose inverse effects contribute to the perfection of vegetation: the sap ascending produces length; descending it deposits nutritive particles, that cause it to increase in breadth; two effects which are admirably counterbalanced.

If plants absorb a great quantity of water, and are kept in the dark, they grow tall, but are *etiolated* and weak; while if exposed to the light, and moderately watered, they are short, strong, ligneous, and bushy: these facts being undisputed, may lead to great improvements in the development of plants.

Something similar happens in animal economy; animals acquire height before they increase in diameter; and the experiments mentioned in the chapter on light, prove that it is as indispensably necessary to the growth of animals, as it is to that of plants.

If we proceed from the vegetable, to the animal

kingdom, we shall find in the metamorphosis of insects, phenomena of mutations well calculated to throw a light on the laws of growth. Man is equally subject to transformations; the fetus may be compared to a larva; the child to a chrysalis, and the adult to a nymph: this admirable progression observed by Dante, probably gave rise to the beautiful verse—

> Noi Siamo vermi
> Nati a formar l'angelica farfalla.

Though concealed from our view, the growth of the human embryo, and that of other animals, has ceased to be a mystery. The primitive form of all animals is nearly similar, says Mekel; but the features of the species are so deeply marked in organized beings, that the first developments are scarcely effected ere the specific distinction takes place.

During the first six weeks of conception, growth is scarcely perceptible, but after this period it proceeds rapidly, more so indeed than at any future time; between the third and seventh month, the progress is very great; the two following months it is less so: the time fixed by nature arrives, the child is born; and coming in contact with new agents, its growth is slow, when compared to that of its intra-uterine life. Children continue to increase gradually in size, till the age of puberty, when they suddenly seem to reach the height and shape they are to retain.

Cabanis has related examples of infants prematurely born, being kept alive, by placing them in situations adapted to their growth, and closely imitating the proceedings of nature; having them wrapped in down, in a temperature similar to that of the human body, surrounded by a moist vapour; and making them occasionally suck a few drops of gelatinous liquid.

Embryos preserved in this manner, have remained in a sort of slumber, till the end of the nine months, when they have struggled violently as if about to enter the world; their respiration during the period of this artificial gestation, has been scarcely perceptible, and it was only at the stated time of their natural birth, that they began to breathe freely like animals having live blood. We have a celebrated example of this occurrence in Fortunio Liceti, a learned man of the sixteenth century, who was a five months child, preserved by the enlightened care of his father, a clever physician; an admirable proof of the power of science, when endeavouring to imitate nature, instead of acting in opposition to its laws. This example shows that when the embryo is furnished with the necessary materials for growth, it may overcome the dangers to which it is subjected by the premature development of its organization; and it also proves, that science alone can produce those miracles, which in ancient times would have given rise to fables like that of Prometheus.

There are undoubtedly, stated periods of life, when the economy has increased activity, and growth is considerably accelerated; this course of nature, takes place in the animal and vegetable kingdom, in both of which there are alternately, great degrees of repose and action, or rather a succession of revolutions, occurring at unfixed times: this repose is not absolute; nature is busy strengthening the internal organs; yet because there is no external development, it is erroneously supposed that growth is arrested. In the progress of organization, nature proceeds gradually, and never leaves an organ till it has fixed the place it is to occupy, relative to the *ensemble* of the economy.

There are undoubtedly great and marvellous analogies in the comparative growth of vegetables and animals; the ascending sap containing no nutritious matter, does not strengthen; it is the descending sap which fortifies the shoot, and arrests its development. Does not something similar take place in animal growth? Is not infancy the epoch corresponding to the rising of the ascending sap? Children have a decided tendency to increase in length, and the highest organs are the soonest developed. Thus the brain is the organ first brought into action: when once this has taken place, the development of other organs, continues in succession, proceeding from the superior to the inferior parts, following the same order as that observed in vegetation, when the

effects of the descending sap are studied. In youth the head first increases, then the chest is extended; the heart and lungs acquire strength and activity; this successive growth is crowned by puberty, when man begins to attain his full size and vigour; and woman advances towards perfection.

All organized beings undergo certain changes; they are subjected to periodical modifications: some pass almost unnoticed; some leave indelible traces in the economy; others appear and disappear at stated periods. The first teeth are generally cut towards the seventh month; second teething takes place near the seventh year; fourteen is the age of puberty; and forty-five the critical age. These striking eras divide life in unequal portions; and are regulated by climate, and the general growth of individuals.

The power of formation is more energetic in woman than in man; females also are earlier developed; and the resistance they oppose to disease, alone enables them to bear the shocks to which they are exposed, through the action of their different functions; particularly that of bearing a new being, which ere long, will become a separate existence; and when fully developed, an independent member of the succeeding generation.

The knowledge of this formative power in woman is highly important; it accounts for the facility with which deformities are consolidated;

and indicates the resources that science may derive in bringing a deviated part to its normal state or its primitive type.

The manner in which the phenomenon of growth is performed merits particular attention. When growth is very sudden, and rapid, one particular organ may predominate, and be too forward, whilst others are backward; equilibrium is thus destroyed, strength is wanting either to resist the morbid or exterior agents; the conformation becomes defective, and the foundation of organic disease is laid.

In these cases, complete atony occasionally takes place in the muscular system, and renders the slightest movement difficult, if not impossible. If there be rapid development in the bony system, the muscles are drawn, and unable to maintain the equilibrium; bad attitudes are then extremely dangerous, having a strong hold on the economy, and giving rise to numerous deviations. While the bones continue to increase, there is a kind of atrophy in the soft parts, and frequently symptoms of a consumptive fever, which either cause fatal injury, or leave traces of great debility, which the disproportioned development of the frame has occasioned to the whole organism.

This state of weakness is common to delicate young ladies, who are injudiciously made to perform gymnastic exercises with a view to strengthen the muscles.

Every sort of development not suited to the

whole economy is dangerous; if the muscles be too much extended, the spinal column is unable to support them, for both sides of the body are seldom equally developed; and as sudden growth does not take place equally in all parts of the body, the equilibrium of the organs and functions is destroyed.

The characteristic of sudden growth is to become tall and thin; the joints are large, and out of proportion; fluids accumulate, and with the atony of the whole economy, give rise to those lymphatic diseases so dangerous in early life. When growth is out of proportion with age, the functions do not proceed regularly; nature seems worn out, with the precarious efforts she has made, and her course appears arrested; general langour ensues; the time for puberty arrives, but does not take place, and the blood rushing to the chest, the lungs, and the heart, causes palpitations of the heart, pulmonary and other affections, which if not mortal, are greatly detrimental to youth and beauty.

A phenomenon that has attracted the notice of medical men, and which has frequently been pointed out, is, that from seven to twelve or fourteen years of age, illness is mostly followed by rapid growth: further attention would shew that nearly all early diseases depend on the manner of growth, and that the greatest care is necessary, both on the part of parents and physicians, at this period of life.

When growth is slow and gradual, it adds

vigour to the constitution, density to the tissues, enables them to bear the exercise they have to undergo, and to resist the morbid agents: the bones and muscles seem to keep pace; the capillary sanguine system predominates, and engenders strength, vivacity, liveliness; all the functions are regular; puberty takes place unaccompanied by illness; the whole economy is in equilibrium: if there be any passing melancholy and lassitude, they may be attributed to the great metamorphosis about to be accomplished, in the performance of which, nature seems to lose sight of the individual, in order to attain its great and principal object, the preservation of the species.

Whilst sudden growth is attended with pain in the joints and general langour, followed sometimes by serious illness; children who grow slowly complain merely of stiffness in their limbs; but there is no disorder in the organs or functions.

The more we consider growth, the more we observe the important consequences to be drawn from this phenomenon; and whether we adopt the opinion of those who believe in the triennial renewal of the whole body; or whether we coincide with those who think this revolution takes place every fifth or seventh year, we must admit the daily progressive change. It is not our province to discuss at what precise period this renewal takes place; the fact acknowledged in science, suffices for the practical inductions we

require. The result of our previous statement is, that the renewal of the economy takes place principally during growth, when the development is not perfect; at which time powerful modifications or antidotes may be administered for either accidental or constitutional maladies, and all the resources of science employed, to effect physical improvement; and whatever prevents the regular development of the organization should be sedulously avoided.

Growth in some instances appears arrested, but this delay is less dangerous than too precocious development; and it would be imprudent to force it by gymnastic exercises, unless they were performed under the superintendence of a judicious person, and by the advice of a clever physician. We shall give our decided opinion on this subject in the chapter on gymnastics.

Experience has proved that in sudden growth, there is generally some organ particularly affected; no artificial means should therefore be used to force growth; and when nature is taking its general course it should not be interrupted, particularly when there is no deviation to be feared.

Pains in the joints and limbs, says Buffon, are always felt when growth is rapid; and the illustrious naturalist observes, that this is not only the case with rickety children, but with all growing persons, who have their joints distended.

In what are termed growing pains, there is neither swelling nor inflammation; the knees are

first affected, then the hips, the elbows and the wrists; these pains seldom last more than a week: some medical men, strangers to the phenomenon of growth, have erroneously attributed them to rheumatism, and the most pernicious effects have resulted from the remedies they have prescribed. Pains in the joints have sometimes been considered as symptoms of intermittent fever; their duration is then subordinate to that of the disease in question. We are far from not admitting *a fever of growth*, when we observe how similar it is to the inflammatory phenomenon; and we are of opinion that in the study of inflammation and nutrition, analogies might be discovered advantageous to science. Let us not however be misunderstood as to the hypothetic opinions here emitted; we do not say that pains in the joints are of an inflammatory nature, but we believe these pains proceed from an extension of the ligaments of which a slight sprain, when not followed by inflammation, may give an idea.

Growing pains require no therapeutic treatment; but they are useful monitors as to the health of young people; and these salutary warnings merit attention. In this stage of life, let a rational system of physical education be adopted; regular and gentle exercise will be found beneficial, while over fatigue, either mental or bodily, suffice to engender a morbid state of some part of the body; for if there be any weak or irritable organ, it is more than usually susceptible, at this

period, and may become the seat of an inflammation caused by sudden growth.

Not only the muscles and the bones partake of the general excitement, the brain itself, as centre of all enervation, and all pain, is also excited by rapid growth, which may be said to take the whole economy by surprise. Some young girls at the time of puberty, have, during two or three months, been subject to madness or to epileptic fits. It would be easy to produce examples in support of this fact; and we cannot sufficiently impress on the minds of affectionate mothers, and enlightened governesses, the necessity of dispensing with arduous study, and allowing the great work of nature to take its course; endeavouring at the same time, to procure some pleasing recreation, which may divert the attention, and alleviate the pains attendant on this crisis.

That *growth governs life*, is a proposition we feel pleasure in repeating; convinced that it is a fact verified by daily observation. It is during *growth* that the finest constitutions are injured; it is during *growth* that vitiation of the constitution, and deviations may be remedied and restored with greater certainty, to their primitive or normal state.

It has been erroneously supposed, that the shape of the bones could not be altered from the fourteenth to the fifteenth year. At that early period of life, ossification is never perfect, and it therefore

follows, that there is no difficulty in modifying the organization.

The bones have three periods of growth; first the mucous, commencing with the other organs; next the cartilaginous, during which divers changes may take place; then the bony, which is the last; and it frequently happens that at eighteen and twenty, the superior and inferior parts of the vertebræ have elongated cartilaginous fibres not ossified.

The change of an ossified cartilage to a bony substance, is always accompanied by a sanguine injection. This observation is essentially important: while the ossification of the vertebræ is imperfect, habitual pressure on one side of the cartilaginous ossification, must on that same side diminish the bony development, and act in opposition to the nutritive fluids, without which no ossification can take place.

According to Pelletan, the vertebral column unites all the conditions admitting alteration of shape, either in the fibres, the cartilage and even the bones, till five and twenty or thirty years of age.

These slight reflections on the growth of the osseous system, which is not completed till the thirtieth year, sufficiently prove, that the *ensemble* of this system, appropriately called the frame, supports the whole economy, and requires constant attention. The sternum, is the bone uniting the different parts of the chest; its ossification is the slowest, and is seldom completed before the above mentioned age.

The preceding observations will prove to every attentive reader, that it is most essential in infancy and adult age, to regulate growth; carefully to watch over all the organs, that they may each be brought into play, and have their full degree of activity and vital energy; and to moderate rapid growth, instead of increasing it by injudicious exercises.

But how is slow growth to be accelerated, and sudden growth to be moderated?

We have already stated that slow but progressive growth is not attended with danger; but this is by no means the case with sudden growth.

We shall merely observe as regards the former, that when slow growth originates in want of good nourishment, exposure to cold, damp, and deficiency of light; change of scene and air, with gentle exercise and wholesome food, are the remedies to be employed. As to rapid growth, if we consider under what circumstances, and in what countries, it is most common, and which are the constitutions most liable to it, we shall find that it is met with in lymphatic constitutions, and in damp countries, where the rays of the sun scarcely penetrate,—where individuals are badly fed, and consume too large a portion of aqueous substances, deficient in restorative principles. The same observations are equally applicable to the vegetable and animal kingdom. In the north of Europe, in damp and shady coun-

tries, tall men are mostly found, while the south abounds with those beautiful figures the ancient artists took for models.

On recalling to mind the experiments made by Edwards, on the transformation of some reptiles, Humboldt's remarks, and the common place observations of travellers, as also the well-known effects of light on the regular formation of organic bodies, it will be admitted that recourse should be had to this agent, as powerful in moderating the effects of growth; for the action of the sun on animals, as well as on plants, seems to equalize the fluids, and prevent their accumulation in any particular part of the body.

It is impossible however, here to lay down rules, that can embrace individual cases. We can only recommend the rational and prudent use of all external physical agents; their combination with wholesome and nourishing food; and in the event of any particular deviation in the economy, the assistance of orthopedy, the resources of which are clearly understood, carefully and discreetly employed; the imitation of nature in its proceedings, a gymnastic adapted to the organs collectively and separately; are the means of which judicious mothers, and philosophical and clever physicians should avail themselves.

It must be remembered that all the organs of the same individual do not come to perfection at

once; and that while one organ is advancing another may retrograde; but if the equilibrium be properly maintained, the general development will take place without any detriment to the *ensemble* of the economy. This is the great object of physical education, and we again state, without fear of contradiction, that *growth governs all the phenomena of life.*

CHAP. XVIII.

Dentition.

"THE operations of nature," says an English author, "are generally conducted in so perfect a manner, that persons with reasonable minds should place the greatest confidence in its powers, and have a doubt as to all hypothesis which point out diseases as consequent to every evolution of the human frame." Disease, as this author states, is not necessary to every evolution of the human frame, but the natural consequence of all disorder.

The growth of the bones, so manifest by the appearance of the teeth, is not always regular, but precocious or tardy according to the state of the constitution. Dentition is the external phenomenon shewing the progress of organization. Slowness in dentition is always dependent on the state of the organization; if growth be delayed or arrested, by the alteration of any important organ, teething is also late. When the teeth come through, it is a sort of crisis which almost invariably causes pain; and this pain alone would suffice to account for the numerous morbid affections to which dentition gives rise. Dentition is not a malady, but while it takes place, children

are more than usually liable to contract disease owing to the action of the nerves known by the name of the fifth pair.

Convulsions, to which children are subjected, are often caused by pain. If adults suffer cruelly from tooth-ache, can we be surprised at the sufferings of young children; and can we wonder that dentition carries off a great number of infants?

Richard the Third, Louis the Fourteenth, Mirabeau, were born with teeth; there are frequent examples of this kind: cases of late teething are more uncommon. Smellie mentions a young man who had no teeth when he was two and twenty years old. Boulli states, that an old man had no teeth till he was sixty; these, however, are exceptions, and but an anomaly so frequent in organized beings.

Dentition generally takes place in the middle or towards the end of the first year; the symptoms of the growth of teeth are, in the swelling and heat of the gums, in the alveolar edge of the jaws, and salivation. The gums are red and soft; children are constantly putting their fingers into their mouths, they are thirsty, take the breast often, but little at a time, as the pressure on the gums gives pain: during teething children are fretful and irritable; they sleep but little, and awake starting; they sometimes have diarrhea, and a tendency to vomiting. These symptoms

may last several weeks, and indicate great activity in the work of ossification, or what is called the nourishment of the teeth; they cease occasionally, and return when the tooth is nearly come through. One cheek is mostly red, salivation increases, the edge of the upper gum seems stretched, and there is a small white spot, scarcely covered by the transparent mucous membrane. This thin pellicle covering the tooth, is perforated, as in cases of ulceration; part of the small bone is then apparent. Having reached this point, the whole tooth often protrudes in the course of two or three days: at other times the growth is delayed. When it is a molar tooth, each point appears successively, pierces through the gum, and it is only when these isolated apertures are united, that the tooth is *cut*. Gentle friction on the gums with the finger, seems to afford relief: a crust of bread given to the child to suck, will also be found soothing, and far preferable to a coral. When the first teeth are perforated, there is less to fear; the child recovers its previous cheerfulness, is playful and happy; salivation decreases, the diarrhea goes off, and growth proceeds regularly. But how many infants perish during the dangerous period of dentition!

The teeth in the lower jaw are generally cut before those in the upper jaw. The upper and lower incisors are first cut, after which the

lateral incisors, then the first molars, the canine, and second molars: these twenty teeth are cut from the age of six months to two years and a half.

Towards the fifth year, four molar teeth, which do not fall out, mark the stages between first and second dentition.

The symptoms of dentition are not the same in all children, though they generally indicate an action on the nervous and digestive system. If on the nervous system, children's cries are plaintive, they have a constant dry cough, which parents, and careless medical attendants mistake for cold; a convulsive motion of the jaws, a spasmodic action of the lips and muscles of the face, shuddering of the whole body, and great irritability and impatience. Some children are in a continual state of somnolency; the heat of the skin is increased, the eyes turned up, and the muscles and limbs convulsed.

When the symptoms act chiefly on the digestive system, children have colics, the abdomen is hard and painful on pressure; the breath and perspiration are sour; the little patients cannot retain their food, and what they throw off their stomachs has almost a fœtid odour: their stools are green, mixed with mucous matter, and albuminous particles. These two great phenomena, of enervation and the state of the digestive system, are consecutively in action. If diarrhea

or salivation be stopped, the nervous disorders increase in intensity, violent convulsions ensue, the strength fails, and the termination is generally fatal.

It is therefore evident, that during dentition, the various symptoms here enumerated merit attention. Diarrhea and salivation must not be suppressed, and the disorders of the nervous system should be allayed by gentle antispasmodics; it is impossible to give judicious care to the physical education of children without an acquaintance with the abovementioned circumstances.

To the symptoms already noticed, must be added, the state of the hands and feet, described by Dr. Kellie, viz. a spasmodic contraction of the flexors of the thumbs and toes; and swelling of the hands and feet.

Dentition being one of the earliest and most important phenomena in the growth of infants, parents and nurses should understand the care requisite for children at this period.

Dentition may be accelerated or delayed; good nourishment and country air conduce to facilitate teething. Alphonse Leroy says, he has often seen children cut one or two teeth before the usual time, when the nurse was feverish or overheated, or when there was inflammation in the breast; the excess of caloric in the milk accelerated dentition in the same manner as plants

are forced in a hot-house; but premature plants die without bearing fruit; while premature teeth decay, and fall shortly after they are cut.

Beaumes states, that a lady lost two of her children during teething, which took place at an earlier period than usual; fearful that her third child should meet a similar fate, great attention was paid to its physical education; cold baths were ordered, they proved beneficial, and the child lived. Beaumes found cold bathing of great service in moderating or delaying dentition. Dr. James Clarke particularly recommends sponging the head with cold water.

If dentition be retarded through want of proper nourishment and good air, the remedy is easily known. When there is general debility, the teeth participate in this state of weakness. When the exhaustion is brought on by bad or insufficient food, or by the injudicious use of medicine; by sudden changes, as, for instance, weaning, children frequently perish at the period of dentition.

It is the general opinion, that children should be weaned as soon as the teeth appear; this plan is free from danger, when the child is early accustomed to other nourishment than the nurse's milk; but if an infant be taken from the breast, without having been gradually accustomed to a change of food, the infantine stomach

is unable to digest the materials given; there is cessation both in nourishment and dentition; the nervous symptoms are more powerful, owing to the child's debility, and it being at a crisis in which nature seems to demand an increase of nourishment, to meet the efforts of growth taking place at this period.

There is no phenomenon which better admits following the progress of growth than dentition. It is easy to observe the phases of sudden growth, and those of regular growth, as we have already described them.

It is never prudent to subject the child who is cutting teeth, to any change in its mode of life; even vaccination should be avoided during the dental crisis, unless an epidemic be feared, for there is danger in whatever may disturb the ossification. Infants often lose their life if taken from the country, or weaned while they cut their teeth: accidental diseases at the period of teething, are more dangerous than at any other time, which accounts for their being often attributed to dentition.

Beaumes says, that children have not only to fear the diseases dependent on teething, but those also that may complicate and render it more formidable. The small pox, vaccination, measles, scarlatina, herpes, and various other affections may occur during dentition.

We cannot here enter into more explicit details,

which would be only suited to a medical work. We write for parents, rather than for the faculty; and the relations we have given are indispensable, to shew the attention requisite at this important period of infantine life.

Country air,—genial warmth of the sun,—good nourishment,—the judicious care of an affectionate mother, or attentive nurse, to assist nature in its work,—not to stop salivation or diarrhea, which are the salutary effects of dentition; are the rules to be followed during this dangerous period.

It sometimes occurs that a tooth remains enveloped in the membrane that covers it. The gum is generally red and tender, and this slight obstacle causes the most excruciating pain.

Hunter relates, that being called to attend a child attacked with convulsions, he could only obtain a cure by scarifying the gums till he reached the teeth. Dehaen has seen convulsions cease immediately after a similar operation. Lemonier relates a very remarkable fact. Wishing to study the phenomenon of dentition in a child supposed to be dead, whose teeth had not protruded, with the parents' permission, he made an operation; and how great was his surprise and delight when, after cutting the gum, the child moved!—the same child for whose funeral, preparations had already been made: the infant thus owed its life to the physician's love of study.

The habit of scarifying the teeth has been carried to excess. In England, this operation is very generally performed. Notwithstanding the opinion and apprehension of many authors, we think that if scarifying the teeth does not always answer the desired purpose, it is mostly inoffensive, and relieves the child by the slight emission of blood.

There is less danger at the time of dentition, when children have their bowels naturally open, but in England, parents frequently give medicine to their infants. To give medicine to children is running the chance of doing them a serious injury; it is as though blood were taken from their veins. Medicine disturbs nutrition, carries off the sap destined to assist the growth of the child, weakens it, and exposes it to all the danger attendant on convulsions.

Nothing requires more judgment and knowledge than the treatment of infantine diseases. The links which attach young children to life are of so delicate a nature, that they are unable to bear experiments; and parents who thus wilfully trifle with the health of their children are highly culpable, and deserve to lose them. There is much less to be feared from leaving children without medicine, than from its injudicious administration. If parents or nurses could be found, who had received a medical education, they might be justified in giving children medicine;

out even in that case, they would still want experience.

What children mostly require is, not medicine, but good food, pure air, proper care, kindness and gentleness. At seven months, the infantine intelligence is sufficiently developed to feel the passions of love and hatred, pain and pleasure.

The art of amusing an infant, and diverting its attention from its sufferings, is not so easy as may be supposed. Rousseau condemned the use of corals, as conducing to luxury in early life. Rousseau did not remember, that children require to be amused and employed; whether the play-thing be in gold, silver, bone, or willow, is quite immaterial; whatever makes most noise has the greatest attraction; the chief object is to amuse. We, therefore, differ from the citizen of Geneva, and think no harm can result from the use of this toy. During teething, children put whatever they can reach in their mouth, and find relief from rubbing their gums, which are not always equally tender. In Germany, little bags of spice and sugar are given to children to suck, in order to maintain salivation. In France they dip any substance in honey, or sweet decoction of barley, as relaxing to the gums; in our opinion, a crust of bread deserves the preference, and it is always easily attained.

It is a very common custom in England, and in many parts of Europe, to give pieces of wax

candle to infants to suck during teething; few parents are aware that this habit is fraught with danger, as in the composition of some wax candles there are poisonous ingredients, by which even the life of the child might be endangered; it will therefore always be desirable to abstain from such a practice, and to avoid letting children put anything in their mouths of which the composition is not known; for the same reason we proscribe india rubber rings, which, by some medical men, are considered injurious.

CHAP XIX.

Vaccination.

When a child has passed over the danger of first dentition, its life is not yet assured; various diseases threaten to assail its weak organization. Eruptive, and contagious maladies, and principally the small pox, which may be considered as the infantine plague, naturally create alarm in the maternal mind. Medical men, of all ages, and of all countries, long strove to protect children from this alarming disease, but for a considerable time, science could only afford hygienic counsel. To purify the air, to observe great cleanliness, to keep the temperament in conformity with the diuretic regimen, to bleed, to give opening medicine, in order to diminish the activity of the variolic virus; such were nearly all the resources of art when inoculation was introduced into Europe.

Notwithstanding the great confidence to be placed in nature, the small pox seldom terminated happily without the assistance of art. We must look to science to abridge what nature prolongs; we must look to science to regulate and overcome a plague whose violence often proves so formidable, or which leaves indelible traces of its ravages.

Art, which is sometimes enlightened by chance, found means to modify the disease, and arrest its development. In ancient times, inoculation was probably known; it was from the Arabians, that the Georgians and Circassians learnt the art of grafting variola on their daughters, in order to preserve their beauty. It was in Thessalia, and on the shores of the Bosphorus, that this method was mostly put in practice.

Through the zeal of Lady Mary Wortley Montague, inoculation soon became in vogue in England. This gifted woman, whose name, as well as that of Jenner, deserves to be immortalized, had her child inoculated at Constantinople; and on returning to her native country, she made known this marvellous secret. The queen of England, wife of George the First, gave the same example to Europe; and families of high rank in Great Britain, had their children inoculated. This gift, which would have been lost to humanity, without the judicious courage of Lady M. W. Montague, arrested the progress of the plague which decimated childhood; but, like all other human discoveries, a few failures had made its success doubted, and inoculation began to lose its credit, when Jenner came forward.

In the county of Gloucester, it had been observed, that there were sometimes on the teats of cows, pimples, called cow pox. While Jenner was studying medicine, at Sudbury, a young country girl came to ask his master's

advice; the small pox was mentioned, when the girl replied, that she could not have the small pox, because she had the cow pox. Jenner still remembered this observation when he began to practise his profession; he remarked that in the parish of Berkeley, the milk-women never had the small pox after they had the cow pox. He reflected on this important phenomenon, and reasoning from the great number of people thus preserved, and from the general opinion, Jenner concluded, that those who had the cow pox were protected from the small pox.

It was not by mere chance that it occured to him that it might be possible to extend this protection by the artificial communication of the disease from one individual to another; but it was by observation, and the power of induction, and analogy, that on the 14th of May, 1796, he first vaccinated a boy named James Philips; the matter was procured from a sore on the hand of Sarah Nelmes, a dairy-maid, who had been casually affected in the course of her occupation.

On the first of July following, the experiment was tried, by inoculating the boy with variolous matter, directly taken from a pustula; this was again repeated after some months, but it produced no sensible effect on the constitution; similar experiments were tried on others; and in June, 1798, Jenner published his first work on the subject.

It was coolly received by some, and violently opposed by others. Jenner placed implicit confidence in his discovery, but could not induce others to adopt his opinions; he belonged to a club, and often brought forward his favourite theme, but no one shared his enthusiasm, and some of the members threatened to exclude him, if he continued to annoy them with his discoveries. What Jenner suffered on this occasion, Harvey had also endured when he made known the circulation of the blood.

Notwithstanding the indifference with which the medical stars of the day heard of this discovery, the young practitioner continued his experiments, and every new trial confirmed him in his opinion of the preventive power of vaccination. Jenner still hoped to be the instrument, by whose aid humanity would be delivered from one of its most formidable scourges. He was not disappointed in this expectation.

Jenner lived to see his discovery appreciated; but while the world proclaimed him the benefactor of humanity, his country proved ungrateful. Honours and titles were showered on courtezans, on warriors; but what recompense was awarded to Jenner, who had won the victory over the plague that decimated the world? The English parliament considered £30,000. a sufficient reward for the man who preserved millions of lives; for the man whom the Greeks would have deified; and whose statue,

the Romans would have inaugurated on the altars of Providence.

The ravages formerly caused by the small pox are scarcely conceived or recollected by the present generation; infants alone were not its prey, but persons of all ages, and all sexes, were attacked, and those who did not lose their lives, retained frightful marks of the violence of this disease.

Jenner was destined to prove the truth of Descartes' observation, "*that if the perfection of the human race could be hoped for, the means to attain it must be sought in medical science.*"

In Dorsetshire, it had long been thought that accidental inoculation of the cow pox, prevented the small pox, but no author mentioned it. Among Jenner's papers was found a note saying, that during an epidemic of the small pox, raging in London, the Duchess of Cleveland was teased by her friends, who said she would lose her beauty, of which she was so proud; she replied, she had no fear, having had already a disease that preserved her from the small pox: however this may be, it is probable that the discovery might have been confined to Dorsetshire, but for the indefatigable zeal of Jenner. These biographical details on one of the greatest benefactors of humanity might seem misplaced, if the gratitude of every mother were not interested in the knowledge of them.

It would be inconsistent with the nature of the present work, to enter into a medical dissertation, but there are, nevertheless, questions which must be elucidated for the benefit of physical education.

Has vaccination a preservative power? What are its normal characters? Must it be renewed? Is it true that vaccination is less powerful than in former times? Is fresh vaccination preferable to any other? The solution of these propositions are of deep interest to every family; and we shall endeavour to solve them. To prevent hideous deformity, to preserve children from one of the most cruel diseases that afflict humanity, is certainly in the province of physical education.

It could not be doubted, that inoculation had considerably diminished the ravages of the small pox; but while inoculation preserved the individual, it, nevertheless, spread infection; vaccination had not this disadvantage. Inoculation of the small pox often causes loss of sight, or other deformities, and develops constitutional diseases. Vaccination is local in its sensible effects; is a better preservative than inoculation; causes no deformity, yet acts on the whole constitution.

According to the researches of Dr. Jurine, it appears, that one child in fourteen died of the small pox. According to Frank, Sussmilch, and Black, the mortality caused by this dis-

ease, was nine in a hundred. Duvillard states, that only four persons in a hundred reached the age of thirty without having the small pox; and that the mortality among adults, was one in seven or eight; and with children, one in three.

In Sweden, says Dr. Maunsell, vaccination was under the protection of the government, and we find, from the bills of mortality, that the small pox destroyed:—

In 1779, before vaccination was discovered,				15,000
1784	——	——	——	12,000
1800	——	——	——	12,800
1801	——	——	——	6,000
1822	——	——	——	11
1823	——	——	——	37

In Prussia, according to Dr. Casper, during the twenty years preceding 1802, Berlin lost 472 children, by small pox.

From 1802 to 1812, the number was reduced to			175
From 1812 to 1817	——	——	50
From 1817 to 1821	——	——	12

From 1821 to 1822, one single child died of this disease.

In 1823, four hundred individuals were admitted into the small-pox hospital, in London; 263 were not vaccinated, 107 died; two had been inoculated, one died; 147 had been vaccinated, twelve died, and one of these alone bore evident marks of vaccination.

But it was principally in epidemics of the small

pox, that the benefit of vaccination was most evident. In 1818, the small pox raged at Edinburgh; Dr. Thompson attended 556 patients, 205 of them were not vaccinated, 50 died; 41 had previously had the small pox, and were marked; there were 30 other cases of secondary small pox, making on the whole 71, three died: 310 persons were vaccinated by Dr. Thompson, and *one* alone died of the epidemic.

In Norwich, says also Dr. Maunsell, during the year 1819, 3,000 individuals caught the small pox, of whom 330 died; it was estimated that there were in that city 10,000 persons who had been vaccinated, and that of these, two in 100 caught small pox: only six had it in its full degree of intensity, two died. The disease also proved fatal to one individual, who had previously undergone variolous inoculation. These numbers speak for themselves, and when contrasted with the natural small pox, mortality of one in five or six, fully demonstrate the great advantages of vaccination. It appears, however, that the mortality of the small pox in those who had the cow pox was very trifling, but a considerable number of the vaccinated, caught the small pox when it prevailed as an epidemic. These are circumstances which diminish the confidence placed in vaccination; but these circumstances thoroughly investigated, only prove, that if vaccination be

improperly performed, it is the same as if children had never been vaccinated, as they cannot be preserved from the small pox.

Jenner early understood the importance of good vaccination, and aware of the advantages his opponents would take of any failure, he strenuously endeavoured to annul all objections, by making the failure as difficult as possible. Jenner thought it of the highest importance to shew the spurious sources from whence a disease imitating the true variolæ vaccinæ might arise, with the view of preventing those who may inoculate, from producing a specious disease, from not discriminating the real existence of the disease, either in the brute or in the human being, and from not observing that stage in which it is capable of producing a change in the animal economy, and rendering it proof against the contagion of the small pox; by inattention, unpleasant consequences might ensue, and the source of them not be suspected by one inexperienced in conducting such experiments.

Jenner observes, that the first object should be to learn how to distinguish accurately the pustule which is the true cow pox, and that which is spurious; until experience has determined this point, the object is seen through a mist.

Another source of disappointment and false influence, according to Jenner, is the inoculation of an imperfect variolous matter, which will pro-

duce a disease, but not one preventive of the small pox.

Without writing a treatise on this important subject, we may be allowed to give some extent to the second question, as it is most essential for parents to understand the characters of good vaccination. Normal vaccine presents a striking resemblance to the small pox; its development is the same; the first period is termed incubation, there is nothing apparent till the fourth day, although some of the preservative virus has been introduced under the skin.

There are instances of longer incubation, but generally after the fourth day, a pimple rises; the top is of a light rose colour, the basis paler; it is surrounded by a slight efflorescence; the fifth or sixth day, the vesicle becomes apparent, there is pruritus; from the seventh day, the vesicle increases, it is circular in its form, elevated at the edges, but the centre depressed; its colour is rather of a blue tint, sometimes silvery; the little tumour grows until the tenth or eleventh day, when it is usually from three to four lines in diameter; the centre of the tumour is darker than the edges, which are, firm, turgid, and shining; at this time the eruptive vaccine is in its full growth and maturity.

Children sometimes have shivering fits, the pulse is quick, the features change; there is occasionally sickness and vomiting; an inflamed

areola surrounds the tumour, under which there is hardness; sometimes the redness extends to the external part of the arm.

From the ninth to the eleventh day, according to the state of the child, the pimple is at its full maturity, and remains stationary nearly four and twenty hours; the little cells of the vesicle are filled with clear transparent lymph; it is then the proper time to take the precious substance to inoculate, and propagate its benefits.

Dr. Maunsell remarks, with reason, that in young children the vesicle appears sometimes earlier, it is, however, more frequently at a later period. The progress of cow pox may be suspended by the intervention of other diseases. The constitutional effect produced by the cow pox was much insisted on by Jenner; but this effect is not always known, because it is so slight that it cannot be considered as a test of the general affection of the system.

According to the instruction of the vaccine boards, we may be satisfied when the progress of the vaccine vesicles has been regular and complete.

Although some rare exceptions could give rise to a doubt, we do not hesitate thinking the constitution is affected, and the child free from danger, if the inoculated disease has had the regular course we have described. When-

ever a doubt exists as to the effects of vaccination, the operation may be repeated, but the second vaccination will not prove that the first was of no avail, as instances of a second eruption is recorded by Jenner himself.

After the eleventh day, the lymph loses its transparency, becomes opaque, puriform, the vesicles begin to decline, the centre dessicates progressively, and changes into a scab, which is of a darker colour, as it becomes harder and drier; the crust is a little concave in its centre. From the twenty-fourth to the twenty-eighth day, the scab falls off, and leaves a permanent cicatrice peculiar to this eruption.

The characteristics of the normal cow pox, after vaccination on human beings, are the vesicular borders, which contain the preservative lymph; the cells, the vesicles, the areola which circumscribe this tumour, and the depression in the centre, are the most constant of all these signs. Alibert says that it is very important to remark the induration existing at the circumference, and under the basis of the vesicle, which is not larger than the redness surrounding it; when this induration is wanting, it may be supposed vaccination is not good.

Having given the characteristics of real vaccination which is preservative, it will be easy to discern the anormal or false vaccine, which is no preservative against the small pox.

Yet false vaccine may deceive parents and

medical men. From the third to the fourth, from the seventh to the eighth day, the areola circle is well formed, the pimple is large, and of a pale colour, the matter is limpid, but the *pimple* is acuminated, it *has not various cells, so that at the first aperture the lymph is discharged, the pimple is unequal, and the surface is not silvery;* but what is chiefly wanting in this false vaccine is the cellular indurated tumefaction existing at the basis of the true and normal vaccine. Another characteristic of false vaccine is, that all the different phenomena of its development are quicker, and that there remains no *cicatrix* after the rapid fall of the scab.

Were we writing for medical men only, we should enter into more minute details, but the generalities here given, will suffice to enable parents to judge when they should require their children to be re-vaccinated. If vaccination, or inoculation of the lymph of any pimple, produce an eruption, which appears the second day, there is every reason to suppose that it is a simple inoculation of pus.

From what precedes, it is evident that it will be necessary to revaccinate, whenever first vaccination has been made with bad lymph, or when false vaccination has been mistaken for good; we think that when second vaccination proves effective, it is generally because the first was not so.

A question has been brought forward calcu-

lated to diminish the confidence parents have in vaccination; it is said that vaccine is less powerful now than it was in the time of Jenner; some little difference, it is true, may be found in the effects of vaccine in different countries, which may be caused by climate; so much so that Jenner himself found vaccine modified in London, and practitioners were in the habit of making many punctures instead of one.

After a long interruption in the appearance of the cow pox, it has lately been found in three different places, so that if the old vaccine were really less powerful, it would be easy to obtain the new, but such is not our opinion; although old vaccine does not present all the inflammatory symptoms remarked by Jenner, its preservative effects are not doubtful, and there are not sufficient grounds to depreciate it. Nevertheless it is satisfactory to know, that the source of this precious lymph is not exhausted, and if so, that fresh springs arise, and confer new gifts on mankind.

Dr. Watt, of Edinburgh, propagated an error which has strongly influenced many parents. He said that the general employment of vaccination increases the mortality of other diseases in infancy; the incorrectness of this fatal opinion has been proved by the statistical tables at Glasgow, and by Mr. Robertson, of Manchester; and the only inference to be drawn from Dr. Watt's opinion is, that statistical tables require a certain degree

of habit, and science, which Dr. Watt did not possess. Calculations made by Dr. Casper, of Berlin, prove, that since the introduction of vaccination, there is a decrease of deaths among children in a proportion of two-thirds.

It now remains for us to consider the most proper time for vaccinating children; generally speaking, anxious parents require this operation to be performed soon. Infants are very seldom liable to contract the small pox before the age of three months, and this period seems desirable for vaccination; the epidermis of the skin is then sufficiently formed to receive inoculation, and dentition not being too active, there is a fair chance for the success of vaccination, and nothing to fear from growth. The preservative value of vaccination is so certain, that no parents are justified in witholding its benefits from their children; and every scientific man, every good and paternal government, ought strenuously to second its providential propagation.

CHAP. XX.

Incidents during the first septennial.

GROWTH, the source of continual irregularity in the functional equilibrium, has been justly recognized as a special and powerful cause of disease, and in following the evolutions of the organs, we follow the order in which diseases occur.

The brain, compared to other parts of the body, is the organ most developed; it becomes the centre of all affections of the body. Convulsions during dentition, convulsions during rapid growth, or through mental emotion, or through the lesion of some organ, or some visceral disorder, are by no means uncommon. The whole organism, and most particularly the digestive organs, have great influence on the brain, and intellectual excitement increases the vital action of the central apparatus.

It is during the interval of first and second teething, that the senses of sight, hearing, and smell, are exercised; that the faculty of attention is to a certain degree developed, and that memory is cultivated and improved. Is it surprising therefore that this part of the organization should be more liable to contract morbid affections?

The modifications to which an irritable temperament is subject, its unequal repartition, its development more or less laborious, its organic predominance, are the principal and probable causes of diseases in children. The elements of organization are forcibly developed in early life, the organs are occupied with preservation and progress, so that any addition of functional and organic activity increase the chances of disorder.

Writers on physical education have not been sufficiently convinced that the period of growth is a time of uncertainty, and constant change. If an adult be ill, his organs have acquired a degree of firmness by which judgment can be formed of the exact state of the disorder of the functions, or the alteration of the organs; but if a child be ill, the difficulty is far greater. The state of childhood is but temporary; the first part of life is a continuation of changes by which the body progresses until it has reached a given point. During the development of the brain, there will be no cerebral affections as in adults, for as the intellectual operations are stamped with irregularity, and the cerebral manifestations are imperfect, the convulsions to which children are liable, are also of an irregular and disorderly nature.

"In infancy," says Dr. J. Johnson, "the organ of the mind presides over and furnishes energy to every other organ and function of the body;

at this period, be it remembered, these organs and functions are in the greatest degree of growth and activity, and, therefore, the brain requires to be at liberty to direct its undivided influence to their support. Were it possible to bring intellectual operations into play, in the mind of the infant, the brain could not supply the proper nervous power for digestion, assimilation, and nutrition, and the whole machine would languish and decay.

If the London Bills of Mortality were consulted, it would be found, that convulsions carry off the greater number of children, and, with the exception of consumption, it is the most fatal disease. The causes of convulsions are too numerous to be here related. Suffice it to say, that all sur-excitation of the digestive or cerebral organs may give rise to them. Either constitutional or acquired weakness induces a predisposition to convulsions, so that there are two important recommendations to be made in the interest of physical education; it is not to over exert the cerebral and digestive organs, and bring children to a state of debility that renders them unfit to receive impressions without emotion.

As growth increases, the organs near the head become more perfect; the larynx, the bronchi, and the lungs, are then the central point of irritation, because they are in a growing state. The croup, or inflammation of the mucous

membrane of the larynx, occurs during the first septennial; no disease affords a better demonstration of the effects of anormal growth; a membrane is secreted, is organized in the trachea; there is excess of life and growth.

This terrible disease shews itself in the insidious form of a catarrh, with hoarseness and a rough cough; the voice is croaking: whenever these two symptoms exist, there is no time to be lost; an enlightened physician should be immediately called; the least delay may prove fatal to the child.

The croup is a foreign body in the respiratory passages: if a single drop of water may bring on convulsion, and suffocation; what must be the effect of a soft, thick membrane, which prevents the circulation of the air, and suffocates the young patient?

Children predisposed to croup, or belonging to families in which this fatal disease has often prevailed, require regular suitable diet; growth must be carefully watched, and colds, however slight, not be neglected. Croup must never be left to nature, but recourse should be had to the most active medicine; and the parents or physician, who merely look on the suffering child, without endeavouring to relieve it, are guilty of homicide. Every possible attempt must be made to prevent suffocation, and as the means to be employed are not in the province of all persons, the assistance of the most

clever physician should be sought. Our present object is to make parents acquainted with the danger to which their children may be liable; it is all the limits of our work permit.

It sometimes happens that inflammation of the larynx is propagated to the bronchi, without producing the false membrane, which is the direct cause of suffocation; this state is not so dangerous. The catarrh, termed suffocating, is almost as much to be feared as the croup, as it consists in secretion of mucosities, obstructing the bronchi, and preventing respiration; in both affections all delay, all indecision must prove fatal.

The hooping cough, a sort of bronchic convulsion, is preceded by catarrh; it also consists in a secretion and accumulation of mucosities in the bronchi; the child makes great efforts to be freed from them. The affection is very dangerous; no expectoration, or only one of a limpid nature, announces violent fits of coughing, of long duration. This disease sometimes baffles all the efforts of medical skill; it is one of the most powerful affections in arresting growth: change of air and nourishment often suffice to produce a cure.

All children are liable to have the measles, which are also an obstacle to growth; they are contagious, the results more dangerous than the disease itself: when the rash has disappeared, parents should not remain in too great a state of

security: in no case should the eruption be suppressed; the measles must be allowed to take their course, without any interruption: at present, as in Sydenham's time, there is nothing to be done, unless a serious complication calls for the assistance of the practitioner.

"With the children of the Countess of Salisbury," says Sydenham, "I ordered them to keep to their beds two or three days before the eruption, that the blood, according to its own genius, might cast out through the pores, the particles that were easily separated, which occasioned the disease; but I did not permit that they should have any more clothes or fire than they used to have when they were well; I forbad the eating of flesh, and allowed them oatmeal and barley broth, and now and then a roasted apple; and for their drink, small beer, and milk, boiled with three parts of water; and when the cough was troublesome, as was usual, I prescribed a pectoral ptisan to be taken often." In the present day there is nothing to be added to these wise precepts.

Scarlatina may also be considered as an infantine disease, very frequently serious in its nature, and more particularly so in its results. Belladona has been recommended as a preservative, and is now in very general use. This remedy is within reach of all medical practitioners, and numerous cases are related in its favor.

The diseases, of which we have given a rapid

sketch, are so many obstacles to growth. While either of these maladies exist, the organization languishes, growth does not proceed; but when the child has once recovered, its organization advances rapidly, as if to make up for lost time. Growing children must, therefore, be strengthened; they must be permitted to take exercise, allowed full liberty, placed in healthy situations, with the advantage of pure air, and the rays of the sun, instead of being confined to their rooms.

Nothing is so contrary to the development of young people as damp habitations, and damp soil; it is in marshy countries that scrofula is most common, and we cannot too strenuously recommend children to be placed in airy situations with a southern exposure. Human growth is similar to the growth of plants; when sun is wanting, plants are *etiolated.* Scrofula is mostly common during dentition and puberty; but there is a material difference as to the seat of the lymphatic swelling. In infancy all effects of growth tend to the heart, the neck, under the chin, behind the ears, near the glands of the jaw, sometimes under the arms, and on the loins; there the swelling of the subcutaneous glands takes place.

The physical education of pale children, with scrofulous diathesis, requires the most assiduous care; they must not reside in dark narrow streets, but be sent into the country; left to play in the open air; in elevated situations rather than in

villages, and their dwellings exposed to the sun.

Scrofulous children require tonic and restorative nourishment; the gravy of roast meat, bitters taken early in the morning, dry friction, sea bathing, and good exercise.

The scrofulous state of the constitution is frequently manifested by the weakness of the joints, spontaneous luxations. The growth of a child of three or four years old, is suddenly arrested; its legs become stiff, weak, and thin; the glands of the neck are swelled, the hair rough, the skin flabby, and the eyes hollow: when children are in this condition, nature alone does not aid their restoration; the swelling of the external glands extends to the internal. Mesenteric scrofula, called infantine consumption, carries off children before they reach their seventh year.

The only means of restoring them to their normal state, and to remove the scrofulous tendency which, if it does not bring children to an untimely end, at least condemns them to a state of continual suffering, is to have good air, wholesome food, exposure to the sun, and exercise.

It would seem that, after first dentition, the growth of the bones is stopped, while it is only marked by the growth of all the other systems of the organism; all causes tending to weaken the constitution of young children, also weaken the osseous system; and we differ from Cullen, who denied the influence of accidental causes on rickets: the same causes that

may produce scrofula, may also produce rickets, which are but another species of scrofula. It must be remembered, that infants bring into the world dispositions more or less favorable to the development of scrofula as well as of rickets; but the influence of external agents on the infantine economy cannot be doubted. How many daily opportunities are there of observing deteriorations in persons who suddenly change their habitations and mode of life!

Rachitis may break out at all ages, but is more common between first and second teething; the symptoms are, flaccid skin, large abdomen, immoderate size of the head and the lower jaw; swelling of the cervical glands; swelling of the articulations of the wrist, the elbow, the knee, the feet; the epiphises of the bones increase in bulk. These symptoms are generally common to scrofula and rachitis; thinness increases, until the patient reaches a state of marasm, and atrophy, and the limbs are unable to support the body: the young patients are sometimes idiots, sometimes gifted with remarkable precocity. When the alteration of the osseous system is not fixed, the ribs become flat, the sternum convex, the thoracic and abdominal limbs decrease, and are distorted; the tarsal and carpal bones are tumefied.

If notwithstanding the great deviations from the normal laws of growth, the period of se-

cond dentition be passed, the vertebral column acquires its full length, is deviated, and its curvatures overthrow the position of the internal organs; life is then maintained in an artificial manner; there arises a species of order in the midst of disorder. Circulation, respiration, digestion, are no longer in their normal state; every thing is displaced, and a strong degree of vitality is requisite to resist the power of so many causes of disorder and death.

Children affected or threatened with rachitis should breathe pure and dry country air. Let it not be supposed we repeat the same thing through carelessness, or that we have the monomania of country air; we are desirous to impress most forcibly on parents' minds the benefit it affords. Are there many ricketty or scrofulous children seen in the country? Are there as many found in warmer climates, where people live mostly in the open air, as in Amsterdam, Paris, and London?

Let children be kept as much as possible in the sun, and protected from the damp and cold; let them wear flannel, be well rubbed, sleep on straw or fern mattresses, in large airy rooms, with a southern aspect; hygiene and therapeutic should mutually assist in affording strength and vigour to young subjects, and to the whole organism. Activity must be given to the functions of the skin, which in scrofula and rachitis are always atonic. Children in this state must

not be left to themselves; the exercise they take should be adapted to their strength. The measures we so forcibly recommend may seem puerile to those unacquainted with the influence of physical agents on life; but as our aim is, if possible, to prevent disease, we earnestly persist in recommending the measures requisite for the preservation of children's health; enlightened care may effect as much for education, as vaccination for the small pox.

To strengthen her son Achilles, Thetis plunged him in the waters of the Styx, yet one part of his body remained vulnerable; all children have some vulnerable point, and all require to be immersed in the waters of the Styx. It may be remarked, that while an organ grows and is developed, it is unusually weak; care should therefore be taken to fortify it.

After having escaped eruptive diseases, convulsions of all sorts, scrofula, and rachitis; towards the sixth year, children's weak organization again approaches a dangerous period; but when it is passed, there is a greater chance of life. Second dentition resumes all the time by which it is preceded; it is easy, if during the first six years, the child grew regularly; in the contrary case, it is both difficult and dangerous.

It naturally follows, that if the child has grown well, and acquired strength, it will be able to overcome the crisis of second dentition, but a weak child, who has been reared with difficulty,

whose health is delicate, cannot afford the excess of nutrition requisite for the growth of second teeth; or the brain is over excited, and irritated by the quantity of fluids rushing to it; and convulsions ensue.

At five years old, the four large molar teeth terminate the first dentition, and begin the second. These four teeth are not intended to be replaced as the first. It appears as though nature foresaw that the first teeth would fall out, and be immediately replaced, and the interval is filled by the four large molars, which are cut towards the fifth year, and which continue to grow while the first teeth fall out.

It has been said, that second dentition was more difficult than first dentition; facts do not justify this opinion; but it is true that the second teeth are cut slower and more irregularly than the first. At seven, the incisors are loose, and come out; they are soon replaced by stronger and larger teeth. The molars are cut later, and there are sometimes symptoms of suffering analogous to those that occur during first dentition.

But when dentition is regular, the child being relieved from its first irritability, the diseases caused by dentition are less dangerous; second dentition sometimes takes place before the first teeth are out; the jaws are then unsightly, and require the assistance of a dentist.

We, once more, strenuously recommend parents to let children enjoy all the advantages of physical agents. The nervous system, and digestive apparatus, are the two points most worthy of attention.

From one to seven, the child has every thing to learn, and if any task be added to the work performed by the senses, there is much to fear for its health. During the first septennial, full liberty is most to be desired; it is requisite for the development of the limbs: the senses are struck by so many divers sensations, that it would be dangerous to increase them.

Regular physical education may commence at seven; before this period let children play, they will learn naturally; parents and nurses teach them to speak; instinctively they see, they hear, they feel; but the organs of the senses are in so imperfect a state, that the functions are of course in a similar condition.

In young children all is study and application; they scarcely make any attempt without recommencing it; no serious instruction is wanted; they sometimes accomplish their purpose better than adults. In children, the love of imitation is carried to a very high degree, when left to the enjoyment of their faculties; but if they are teased, and made uncomfortable, their attention is confined to their sufferings. Let children have air and liberty; do not force the young plants to

bear precocious fruit; let them pass through all the phases of their development.

The only study we would allow from three years old till seven, would be the study of languages; not as it is generally understood, but by placing with children intelligent persons belonging to foreign nations. Let an English child have a French or German nurse; a French child an English or German nurse. Children may thus early acquire a knowledge of foreign languages, without excess of mental exertion. Later on, the grammar may be advantageously taught, when children are able to understand it. We knew a child, at the early age of seven, speak English, French, and German; yet he had enjoyed full liberty, and had never opened a book; he was not a Cicero in each of these languages, but knew more than many boys of fifteen, who had been fatigued with study.

Let there be no books, no excess of mental exertion, no writing or drawing, no premature intellectual development. Before we make prodigies, let us strive to have children that may become useful members of society.

If care must be taken not to fatigue the brain, the digestive functions also require attention. We have remarked that the brain and stomach are most liable to be affected, during the first and second dentition. The stomach should never be overloaded; the consequences of indigestion

may prove fatal; the bowels must be kept in good order, not by the use of continued medicine, but by good and wholesome varied food.

The child having reached its seventh year, and there being nothing to fear from well directed studies, we may continue to give rules, sanctioned by experience, and consistent with the laws of physical education.

CHAP. XXI.

Organic Structure.

We have hitherto made abstraction of the influence of motion, or the power of action, which have, nevertheless, so strong an influence on the human economy. We have only considered the human being in a negative manner: we have studied passive life, and it now remains for us to consider active and spontaneous life. Among the human movements, some are internal, continual, and free from the empire of the will; others are subjected to it, and to these latter we allude.

The principal organs of voluntary motion are bones and muscles; some are levers and supporters; others are links and ties.

The osseous parts of the body are admirably disposed; the head is supported by a pyramidal column, on which it moves; this column is composed of four and twenty vertebræ, united by ligaments and elastic cartilages. The spinal column is the centre, and support of all movements: owing to its articulations, it bends and straightens, or else is kept in equilibrium by the effect of the ligaments, cartilages and muscles; it forms a powerful lever, elastic and moveable, or firm and steady.

The spine is the flexible axis supporting all the organs of the body. The vertebral column is convex near the neck and loins, concave at the back; sometimes slightly inclined, and convex to the left. The moveable bones, serving as levers, are always placed between two opposite muscular powers, which give to this order of muscles the name of antagonist, and that of congenerous to all those tending to produce the same motion. Thus it will not suffice in movement to conquer the resistance of any given object; we must also conquer the resistance of the antagonist muscles.

This antagonism of the muscles is seldom perfect, and it is sometimes because the equilibrium is destroyed, that the osseous axis bends more on one side than the other, and that the deviation is caused. The human frame has a tendency to bend, not on the side of the weak muscles, but on the side of the strong ones.

The muscles have sometimes various functions to perform: thus the glottis is at times congenerous, at others antagonist to the respiratory muscles; but, generally speaking, the action of one muscle does not cause the relaxation of another muscle, but forms the neutralization in the equilibrium of the organs. All muscles are both antagonist and congenerous.

In infancy there is but little difference between boys and girls; but in girls, often, of twelve years old, the features are more strongly

delineated, the chest expands, the muscles are weak and thin: the spine lengthens till the time of puberty; but this change established, bones increase in breadth, and acquire a greater degree of solidity. The sternum forming the cavity of the chest, is one of the bones latest consolidated.

Till eighteen to twenty in woman, and twenty to twenty-four in man, the work of ossification is not completed. It is especially on the length and not the thickness of the muscles, that the energy of nutrition acts. Girls, though precocious in physical development, do not depart from the primitive delicacy of childhood; all the tissues are impregnated with a great quantity of fluids, which render them less firm, and the bones and muscles do not acquire the same strength and solidity as those of men.

In all ages of life the physical constitution of females is more delicate; if, therefore, nature has granted different attributes to females, and we love woman for her feminine qualities, grace, and mildness, let girls not be subjected to the rough and violent exercises which contribute to the majestic development of man. Let us take Praxiteles or Canova's Venus for models, and not Minerva of Lacedemonia, with a helmet and spear!

But man is not only composed of muscles and bones, there are other organs requiring physical education. To increase the power, and

regulate the action of the senses, they must be exercised. The lungs, the stomach, and the brain, also have their education; and the skin, that covers the whole human frame, the normal state of which contributes so much to beauty, is one of the organs playing the most prominent part in all the acts of life, and demanding the greatest share of attention.

It may, perhaps, be thought that the above description of the structure of the human frame is superfluous, and of too scientific a nature for mothers and governesses; yet why should they be ignorant of the relations of the different parts of the system, while a knowledge of it might tend to prevent disease; or when disease exists, contribute to facilitate the cure? Every woman of experience and judgment must feel that it is essential for her to have an acquaintance with whatever may conduce to her children's welfare.

It is from ignorance, that unfortunate children have been made to work twelve hours a day in factories, in a close atmosphere: at present the Factory Regulation Bill has limited the time for work to eight hours, for children between the ages of nine and fourteen. To us this appears an excess of labour, and the most simple knowledge of the human constitution would clearly demonstrate the lamentable effects likely to arise from the laws sanctioned in this country.

If the osseous system be not consolidated till eighteen or twenty, what is to be expected if children are overworked from nine to fourteen?

Dr. Hawkins, in his statistical account, has fully elucidated this fact, by comparing the state of 350 children, of both sexes, engaged in factories, and 350 differently employed. Of

350 not in factories,	But of 350 in factories,
21 had bad health	73 had bad health
88 had middling health	133 had middling health
241 had good health	144 had good health

Had legislators been acquainted with the human power, we are inclined to think they would not willingly have condemned their unfortunate fellow creatures to the continual state of suffering arising from over fatigue, and deprive them of their health, which is their greatest earthly happiness.

the same; the observer sees only a mass of study, a multiplicity of occupations, leaving no time for exercise. In England as in France, three or four hours per day only are allowed to children for the development of their limbs; and in many establishments, great part of the time allotted for recreation is taken up by the infliction of punishments. Should we exaggerate in saying more care is bestowed on horses than on children? The former are never left without the exercise necessary for health; we wish the same observation could be applied to the latter. Deprivation of nourishment and of motion, are the punishments given to pupils, by teachers ignorant of the laws of growth, and of the necessity of nourishment and exercise for the development of human beings; and because some immediate danger does not attend the mismanagement to which we allude, the same plans are pursued, and the foundation of good health destroyed.

Let those persons who profess to take care of children, derive a useful lesson from their active exertions when left at liberty. They climb, they run, they dance, they jump, and seem almost overpowered by their ownexhilirating spirits; the world seems hardly large enough to contain them; and these are the lively active beings, confined for hours in the same apartment, sometimes even to the same seat, in a close atmosphere! By acting thus, preceptors defeat their own purposes; human instinct is stronger than any discipline;

children will move; repose is odious to them, and they dislike all those who may seek to prevent their freedom of motion: if study and inaction be associated in the youthful mind, both will be equally objects of abhorrence. Young persons, and those who are not advanced in years, if healthy and of warm constitutions, are never greatly inclined to mental exertion, till their bodies are to a certain degree fatigued, we do not say wholly exhausted Till this fatigue commences, the body has a preponderance over the mind, and in this case exercise is a truly natural want, which cannot easily be silenced; each muscle requires exertion, and the whole machine strives to employ its powers. If the fatigue be once brought on, the call for bodily exertion is stilled, the mind is no longer disturbed by it, and all its labours are facilitated. It may always be remarked that children who are most active during recreation are most diligent at their studies. Those who saunter about during play time are generally lazy in school hours; both heart and body seem worthless; the brain and muscles want activity. Vice takes root in idleness, and it will ever be found that exercise is conducive to good morals as well as to good health.

Unfortunately, in the present age all is sacrificed to intellectual education, as though nature were unable to bear exertion of body and mind. The great art in education is to combine mental and

corporal development, not to oppose one to the other. If a prodigy in learning be required, he will be weak and sickly; if extreme bodily strength be sought for, and we strive to make a young Hercules, he will be ignorant. There is a great defect in the usual mode of education,—it is the absence of manual labour; this deficiency could be made up by letting children of every station be occupied in learning the elements of different trades, which could be so easily taught in schools. Where are the children not anxious to imitate Robinson Crusoe, and build a hut?

Persons are often met with, who scarcely know how to make use of their hands: they are almost unacquainted with carpenter's tools; they have minds but no bodies. "Besides other advantages," says Salzmann, "arising from the acquisition of some handicraft, we should not forget another important object, that of initiating the youth, whether study be his destination or not, into the mysteries of a science, which is the soul of active common life, the science of mechanics. As he must come to act his part on the stage of life, surely it must be of advantage to him, to be acquainted with a science, which has so much influence on its daily occupations, and is so intimately connected with the knowledge of things. This appears to us one of the most inexcusable neglects in the ordinary plan of education; for no one will deny, that the science

of mechanics is one of those few which are indispensable to every one, from the peasant to the peer, either practically, in his actual employments, or theoretically, as an introduction to more extensive knowledge. What may not be expected from a nation, apt for invention from its penetrating mind and persevering spirit, when a theoretical and practical knowledge of mechanics, to which we are indebted for most of our inventions and manufactures, is generally diffused through all its members?

"We deem it, therefore, extremely beneficial, first to instruct the youth practically in the art of the cabinet-maker and turner, and thus to familiarize his hand to the mechanical use of tools; and as soon as this is accomplished, to lead him to the construction of machinery, combining the theory of mechanics with the practice, by employing him in making models of different machines, and at length prompting him to invent new ones himself."

In our opinion, gymnastics are imperfect if confined to exercises of equilibrium, riding, jumping, fencing, and dancing. In the term gymnastic should be comprised corporal education applied to all the wants of life; but before we proceed to lay down rules for the development of the muscles, we shall first study standing and walking, as the foundation of all gymnastics.

CHAP. XXIII.

Standing and Walking.

STANDING and walking are the foundation of gymnastics. Standing is that state in which man maintains his equilibrium vertically on the ground, supported by the legs and feet. In this apparent state of inactivity nealy all the muscles of the body are in action.

The head is placed on the summit of the spinal column, the vertebræ one above the other, the whole spine on the pelvis, the pelvis on the thighs, the femur on the legs, the legs on the feet, which bear the whole weight of the body.

"The splendid problem of the erectness of man," says Delpech, "has not been sufficiently studied;" at least it appears not to have excited that astonishment and admiration it calls for, and which Milton so well described.

A serpent drawing itself up, and resting on its extremity, is not more wonderful than the erect position of man. A complicated structure, with jointed parts, more or less inclined one on the other, supported by two moveable pillars, able to act rapidly, with the power of alternately supporting the weight of the body, must be considered as one of nature's most admirable works. An erect attitude necessitates the assistance of all the muscles, and their participation in this

striking phenomenon so well known, and apparently so easy, must be more or less great, according to muscular strength or weakness.

"A body is tottering," says Arnott, "in proportion as it has great altitude and narrow bases; but it is the noble prerogative of man to be able to support his towering figure with great firmness on a very narrow base, and under constant change of attitude. This faculty is acquired slowly, on account of the difficulty; a child does well who walks at the age of ten or twelve months.

All the Chinese ladies have to acquire the talent of mutilated soldiers, who walk on two slender wooden legs. The Chinese are crippled by confining their feet for life, in such shoes as fitted them in infancy. Among children, the difficulty of standing depends on the reclining state of the pelvis forward, and principally on the weakness of the dorsal muscles, which cannot resist the weight of the head, and of the abdominal viscera, After a long disease, when a young patient has been confined to his bed, if the lumbar and dorsal muscles are weakened, he cannot stand without support.

If an erect attitude requires the use of nearly all the muscles, it is certain that walking calls the whole of them into action. The body continually leaning forward, alters the centre of gravity, and the equilibrium rests alternately and

at every step, on a different limb. In these movements the parts of the human frame, which are constructed the one on the other, bring the inferior muscles and the spine into action. The arms serving as a balance, and moving in a contrary direction to the corresponding legs, necessitate the contraction of the muscles of the shoulder, as well as those of the leg.

Thus, in walking, nearly all the muscles contract; going up any steep place, requiring a struggle against the laws of gravity, calls for more strength; owing to the continued position, the chest is fixed, the lungs expand with greater difficulty, and the respiration is slower; in ascending a hill, great warmth is always felt at the knees. In descending, the body is thrown backward, and the effort consists in maintaining it, for it is naturally inclined to follow the laws of gravity; this effort causes much fatigue, whilst it appears so easy. The lower part of the body being thrown forward, the superior part is thrown back, and the vertebral muscles support the fatigue. The rope-dancer usually carries a long pole in his hand, to balance himself; it is loaded at each end, and when he inclines, he throws it a little towards the opposite side in order to maintain the equilibrium.

The man who carries a load on his back, leans forward; if he bears it between his arms, he hangs backward; he always leans on the oppo-

site side of a weight. Some fat people have the shoulders and the head thrown backward, like the pregnant mother, and the dropsical patient.

The nature of the ground either favours the action of the muscles, or opposes resistance to them. The softness of the earth or grass increases the effort of walking; the motion of a vessel at sea, causes continual contractions of the muscles. In order to make the centre of gravity fall on the basis of support, sailors extend this basis as much as possible, and it is easy to distinguish them, when on land, by their gait.

Whether standing or walking, females are less sure of their equilibrium than men; their toes are more turned out, which may be considered more elegant, but is by no means firm. Slow walking is best adapted for females, and has most influence on the functions. Military marches are neither suited to their constitution, their figure, nor to the delicacy of their movements.

Running is not pleasing in women; a celebrated author observed, "that women only ran in order to be pursued and caught." Little girls oftener fall down than boys, when they run together. The butterfly chase is well suited to children: the inconstancy of the butterfly is emblematic of the inconstancy of youth: while the insect rests on the flowers, the child advances slowly, without noise, and there is a short truce between the two adversaries. The gymnastic position should

then be observed; the child comes gently forward, stoops down to hide herself, then rises on her toes, her arms spread out, armed with the fatal net, destined to catch the inconstant butterfly. This graceful hunting is the only one fit for young ladies, notwithstanding the example of Atalanta and Diana, who are always introduced by the lovers of antiquity, as though Diana and Atalanta were not the ingenious fictions or the brilliant creations of Greece, so prolific in poetry and allegories.

Daily walks are essentially beneficial to girls; but the situation in which they take their exercise, must be airy, free from damp, and open to the rays of the sun; the influence of the exercise is not then confined to the locomotive organs; but is indispensably allied to the cultivation of several external senses; it draws the fluids towards the inferior limbs, and thus counterbalances their tendency to reach the brain. After walking, the appetite is always keen, and should be satisfied, in order to repair the waste occasioned by the exertion.

We do not prohibit running for boys. It may be useful in assisting to develop the respiratory organs; but as its influence is carried to the lungs, if it be too violent, young persons suffer from head ache, and are apt to spit blood; at other times, when the blood rushes to the heart and lungs, the former is dilated, the latter are

irritated: many examples are found of aneurisms and phthisis, for which running has been the principal attributable cause.

Jumping, which, according to Clias, is one of the finest and most useful exercises for men; is neither useful nor graceful in women. In cases of fire, or inundation, instinct never errs.

Medical men, in the daily habit of attending females, aware how many diseases are caused by sudden shocks, either from a jump or fall, will not admit the expediency of jumping: the brain, the spinal marrow, the internal viscera may suffer from dangerous concussion.

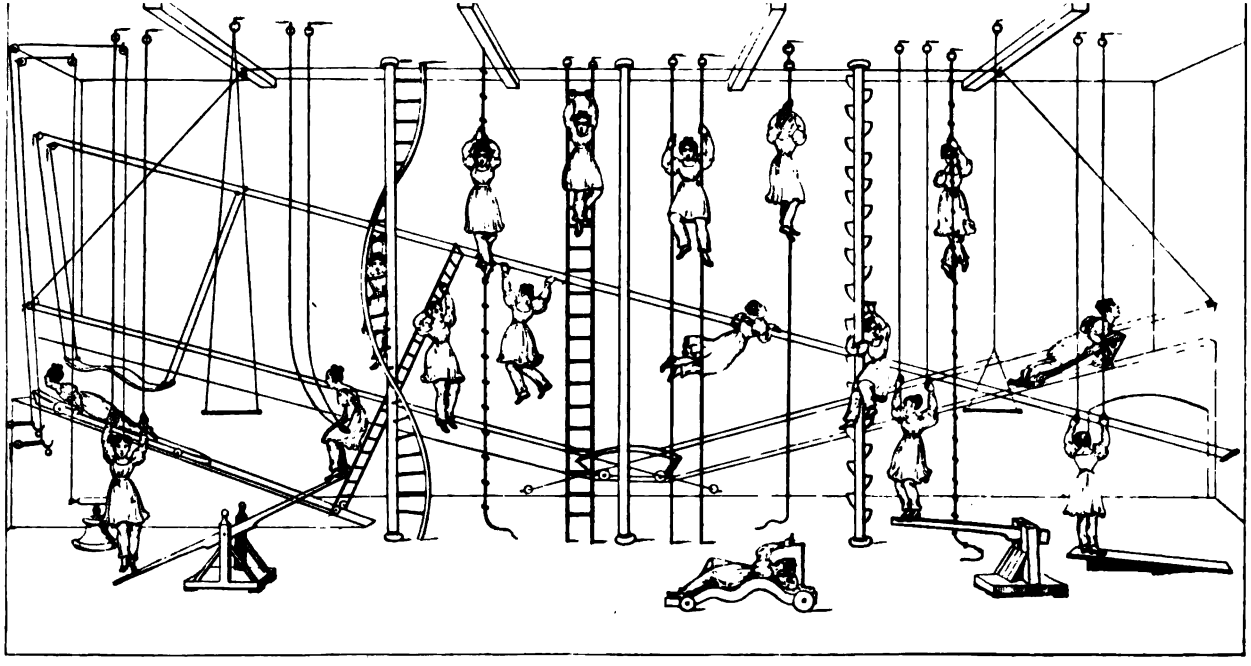
Towards the period of womanhood, jumping may be attended with the most serious consequences. In sudden and rapid growth, it may be followed by an extension of ligaments; or the foot may slip, and the ankle be sprained.

However, every one should know, that in jumping, it is right to fall on the toes, and to bend the knees and hips, in order to break the fall; that both feet must come to the ground, and the breath be kept. Growing girls should not be permitted to jump more than two feet from the ground; and to leap from any greater height is not judicious.

According to some systems of leaping, girls might be brought to leap over walls, and jump out of a second floor window. We should not

have alluded to this error, had it not been laid down as a precept in calisthenic exercises. Jumping and running are gymnastics so little suited to females, that it is needless to offer any further observation on the subject.

After these preliminary observations, which appear to us necessary, we shall proceed to the gymnastics of schools for boys and girls.



GYMNASIUM FOR THE NORMAL & ANORMAL STATE

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CHAP. XXIV.

Gymnastics.

THE most celebrated physicians, and all who have studied what best conduces to the perfection of physical education, concur in thinking that bodily exercise, wholesome and temperate diet, and pure air, are necessary to health. By the judicious employment of physical agents, infirm adults may be rendered strong and healthy; whereas, ease and luxury only produce weakness. Unfortunately, parents, who should be their children's best friends, often prove their greatest enemies; they restrain their children from corporal exertion, which is so conducive to health and vigour, strengthens the muscles, braces the nerves, and promotes circulation. Nourishment alone does not suffice for the body; the separation of what is not converted into blood, is equally necessary. Perspiration should be induced, but it must be gentle, not excessive; hence the necessity of exercise; which also assits digestion, improves the appetite, regulates the bowels, and refreshes both body and mind. Persons who take regular exercise, are seldom afflicted with severe diseases; whereas, those who are afraid of exertion, are exposed more than others to the various ills that assail human life, with less

power to bear up against them. The most effectual preservative from disease is bodily motion; it not only removes the causes of disorders, but strengthens the body, gives it a proper tone, and enables it to resist contagion.

Whoever has noticed the effects of corporal exercise, and observed the great refreshment of mind and body arising from it, will no longer doubt its efficacy, or the impropriety of confining children too many hours in one room, with a view to improvement. Sitting and standing still, for too long a time, destroy the equilibrium of the functions of the economy, which bodily activity is necessary to preserve. These observations will be found generally useful; they are applicable to adults, though far more so to growing children.

The circulation of the fluids, moderate and well-directed exercise of all the limbs and muscles, are very necessary to promote growth. Stiffness of the body is often seen in persons who have not been accustomed to take proper exercise in their youth: this is a subject to which we cannot give too much attention.

Proportionate growth is conducive both to health and beauty; many people, for instance, have the chest too straight for the lungs, in consequence of not being able, during growth, to expand this part daily, by the forcible respiration caused by exercise; while the lungs in the mean time, continuing their proper growth,

begin to form cohesions, or to be compressed in a cavity too narrow for them.

Our opinion is, that gymnastics not only preserve and fortify the health generally, but we may assuredly state that, by their aid, an enfeebled body is strengthened. How contrary to reason is it for persons, whose nerves are relaxed, whose muscles are weakened, and whose health is impaired through violent passions, an inactive life, or intense study, to seek for restoratives in internal remedies. How much more likely is it that bathing, and moderate exercise, would restore vigour to the solids, and accomplish the desired purpose.

"If we look into a well-directed school," says a sensible writer, "sixty or seventy pupils are seen in good health; fresh comers join the group; some are far from robust, others weak and infirm; in a short time, they become as strong as their companions. There may be occasional illness, but even this seldom occurs. Can we say the same of private families? one child or other is generally ailing; the reason is obvious; children at school having regular meals, good exercise, their bodies are strengthened, the circulation of the fluids kept up. Whereas, children at home are surrounded by luxury, sleep on feather beds, are carefully guarded against every change of weather, confined to their own apartments, and deprived of what is most conducive to health—exercise.

Among the Greeks and Romans, the most enlightened people of antiquity, children were not considered well educated, unless they had followed the regular course of the gymnasium. We are not inclined to make a display of an easy erudition, by entering into minute details on the gymnasia of Greece; we need only say, that the application of gymnastics to the perfection of man, to the development of his faculties, and to the treatment of some diseases, may be traced to the remotest antiquity.

Medea, who, in mythology, was termed a magician, and had the power of restoring health, possessed no secret; her magical art consisted in well-combined exercises, adapted to the state of those patients who came to her for counsel. Herodicus, a native of Selymbre, who flourished 443 B. C., was surnamed Gymnastic, because he introduced gymnastic exercises into medical practice; he was brother to the famous rhetorician, Georgius, and Hippocrates was his disciple.

The life of Herodicus was protracted by gymnastic exercises; notwithstanding his natural debility, he acquired strength by using the same remedies for himself as those he prescribed for others; nevertheless, he appears to have gone too far; as, according to Hippocrates, Herodicus killed his patients by ordering *too much exercise;* long walks, wrestling, and running. Herodicus professed to conquer the fatigue occasioned by illness, by another species of fatigue, which

sometimes brought on inflammation, pains in the side, and great paleness.

But if he erred in his system of gymnastics in chronic diseases, he was more fortunate in prescribing the means of preserving health, and prolonging life; his success drew forth rebukes from Plato. It may probably be thought surprising that this philosopher should have condemned Herodicus for preserving the lives of numerous infirm valetudinarians; but in a republic, where every citizen was expected to be useful, it was thought more advantageous for the state, that the aged and infirm should perish.

Herodicus was at the head of an academy, where a system of gymnastics was pursued, and though at a very advanced age, yet he so judiciously combined these exercises with other means used in medicine, that notwithstanding his sickly constitution, he overcame the numerous ills that assailed him, continued to drag on a long life, reached an honorable old age, and rendered this, according to Plato, *evil* service to many other infirm persons.

Among those who have written on gymnastics, are Hippocrates; Galen, his learned commentator; Celsus; Avicene; Oribaze. After a very long interval, Mercurialis, in 1675, recalled the practice of the Greeks and Romans; their exercises, and the time fitted for them, and the machinery employed. After Mercurialis,

Fuller, published in London, his medical gymnastics, and Tissot, a medical and surgical gymnastic. Gultsmith, in Prussia; Jahn, Clias, Salzman, and Pestalozzi, in Switzerland; Londe, Begin, Delpech, Broussais, Amoros, in France; Shaw, Walker, Hammon, in England; have, at various periods, written on gymnastics, considered in different points of view. But this subject is by no means exhausted; there is yet a choice to be made; it behoves us to endeavour to perform this task in the interest of physical education, whether for the healthy or unhealthy.

The art of gymnastic consists in regulating the voluntary motions of the body, and giving them more strength and precision. It embraces the practice of all exercises tending to render man more courageous, intrepid and active; it enables him to overcome difficulties; to preserve health; sometimes to re-establish it. Gymnastics are useful in all professions, as an instrument for becoming dexterous in every undertaking. Gymnastics re-establish the equilibrium of the different parts of the body, calling into action the weak muscles, and conducing to repose those which are too much developed. Gymnastic is the art of regulating exercise and motion for the regular growth of the body, its perfection, strength, and beauty.

CHAP. XXV.

Scholastic Gymnastics, (Normal State.)

In every well-directed establishment there should be a gymnasium, in the open air, or in a spacious and well-ventilated apartment, that pupils, in bad weather, may take exercise. Ladders, masts, ropes, are the indispensable ornaments of a play-room. Jumping, climbing, running, wrestling, singing, are necessary exercises for the development of the muscular powers; the object of gymnastic is, to develop and strengthen the legs, the arms, the hands, the loins; in short, the whole of the human body.

The accompanying plate represents all that is necessary in a gymnasium. In technical terms, there are cords, pullies, weights; principally intended for healthy children; but suited also, with very slight modifications, for the weak and sickly.

Colonel Amoros, through whose perseverance gymnastics have been nationalized in France, has divided his method into fourteen parts; it would be rendering justice to his zeal and successful efforts, to give a sketch of what he has termed gymnastic method, of which he is the founder; but the limits of our work do not

permit us to draw even an outline of his extensive plan. The positions, or elementary gymnastic movements, have been specially adapted for girls, and would not suffice in the physical education of boys. M. Amoros says, "that elementary movements are to gymnastics what spelling is to reading; and, in support of his own opinion, he brings forward that of Pestalozzi, whose name is entitled to respect.

Colonel Amoros subdivides the elementary positions into thirty-five exercises; which number might be easily reduced to the motion of the head, the body, and upper and lower extremities to backwards and forwards, right and left. He combined singing with gymnastic exercises: though not exactly of the same opinion, we admit that singing of itself, develops and strengthens the organs of the chest; but we do not think that it should be combined with muscular active exercises. There is a physiological remark to be made on the subject. In moving, it is difficult to regulate the respiration; those who run for wagers, or who take violent exercise, keep their mouth closed, breathe through the nostrils, and thus try to diminish the movements of the chest and lungs, as if to counteract the effects of muscular contraction.

Dr. Wardrop, in his work on diseases of the heart, has explained these facts; in the motion of the limbs, there is contraction of the mus-

cles, increase of blood in the cavity of the heart; but if the lungs expand, while the limbs move, the heart is deprived of the capacity afforded by the pulmonary vesicles; the blood rushing from the lungs, remains in the heart, or is carried to the head.

We have heard singing during exercise in Colonel Amoros' gymnasium; all the pupils became red in the face: they struck their chests while singing; thus communicating a rapid shock, and producing general commotion in the lungs. The reasons he gives for this practice appears to us by no means conclusive: for in the exercise of our profession, we often meet with patients spitting blood, through blows received on the chest: we do not, therefore, think it prudent to make use of exercises even when there is but a prospect of their proving injurious, much less when physiological knowledge shews them to be decidedly prejudicial to health; for this reason, it is ever desirable that a gymnastic establishment should be under the immediate superintendence of a medical man.

In all gymnastic exercises, the use of a belt is recommended; it diminishes the capacity of the chest, in elevating the intestines, the stomach, and diaphragm, and thus prevents the lungs from expanding too much.

It is certain that singing gives as much activity to the circulation as the exercise of other

parts of the body; but singing, during exercise, acts in a more powerful manner than the belt. It is impossible not to admit, that the chest is dilated by singing. The blood therefore repelled from the lungs by muscular movement and singing, must return to the heart, or the brain, and produce congestion. These considerations are sufficiently important for us to desire to see them corroborated by the authority of a celebrated medical man, who has devoted himself to this study; and we cannot, therefore, do better than quote Dr. Wardrop. He says, "We may observe an almost infinite variety in the period which is required to tranquillize the movements of the heart and lungs, after they have been disturbed by any muscular exertion; that period depending on the violence of the effort, as well as on the *condition*, as it is called, of the person by whom it has been made.

"These observations naturally lead us to inquire what are the means by which a person attains the power of regulating the respiratory and circulating organs, so as to be able to make violent muscular exertions, until his muscular energy is exhausted; or in what consists the art of training?

"This subject has never sufficiently claimed the attention of physiologists, and no one, as far as I know, has contemplated what, or whether any changes take place in the physical condition of the thoracic viscera of those who have

been trained to perform feats of strength. It has been usually considered, that the only change produced on the system by training, has been an increase in the muscular fibre; but a careful investigation of the varied functions of respiration and circulation, along with some points in the anatomy of the respiratory apparatus, will enable us to give a more satisfactory elucidation of the changes which takes place, and will also lead to an explanation of several symptoms in the diseases of the thoracic viscera, which have hitherto evaded pathological researches.

"If we attentively examine the nature of training, or "putting a person in wind," we shall find it consists in respiration being so regulated during muscular exertions, that any pulmo-cardiac congestion is prevented; and this is effected by permitting the lungs to receive only such quantities of blood as shall not destroy the proper adjustment between the respiratory and circulating organs, whilst, at the same time, a quantity of air is inspired, sufficient for the arterialization of the blood; and the muscular contractions are allowed to proceed until the energy of the muscles becomes exhausted. For, as I have already mentioned, if pulmo-cardiac congestion go beyond certain limits during any muscular exertion, the person becomes exhausted; not from the muscles being fatigued, but from the cavities of the heart and pulmonary vessels

becoming so loaded with blood, as to interrupt respiration.

"There is a circumstance regarding the anatomy of the lungs, described by Sir E. Home, which assists in explaining this peculiar feature in the function of the pulmonary apparatus. From his observations, it appears that, in proportion as the air cells are distended, the circulation of the blood in the pulmonary vessels is interrupted; and that if the cells be completely distended, the extreme ramifications of the pulmonary arteries cannot transmit the blood to the pulmonary veins.

"When the arteries of a sheep's lungs were injected, the injection returned very readily by the veins, but when the air cells were previously distended, this did not take place, and the injection could not be forced into the pulmonary veins. In further illustration of this important physiological observation, I may remark, that by very full inspirations, the action of the heart is diminished; the shorter and the more frequent the inspirations, the more rapid become the movements of the heart; and when, from disease, a portion of lung is no longer capable of assisting in the arterialization of the blood, that which remains sound having an additional duty to perform, respiration becomes increased in frequency. Respiration being quickened, there must necessarily take place an increase in the heart's action; and hence, can be explained

that quickness of the pulse which has been considered a pathognomonic of tubercular phthisis.

"From the foregoing observations, we are warranted in concluding, that too full inspirations, by over distending the air cells, and thus impeding the pulmonary circulation, will prevent the continuance of muscular exertion, whilst if the inspirations be limited, so that the air cells cannot be over distended, the free circulation through the pulmonary vessels will not be interrupted, and the muscles may continue to act until their energy is exhausted.

"The training consists in acquiring a certain controul over the respiratory organs; and that one of its essential conditions is that of limiting the inspirations, can be demonstrated by examining the mode in which respiration is performed, by persons who are properly trained for athletic exercises. It may be remarked, that those who are best trained, require great care and nicety, in order to adjust the respiratory organs.

"The trained dancer commences his performance by increasing the movements of his body in a very gradual manner, and an equilibrium is thus established between the respiratory and circulating organs; so that afterwards he can perform his greatest feats, and continue his exertions until his muscular energy is exhausted. It is the same with the prize-fighter, for whom, to retain his greatest physical powers, it is ne-

cessary that the muscular exertions which he is about to perform, be at first made only in a very moderate degree; for if, from passion, or too much excitement, he is induced to make a violent effort at the commencement, the necessary adjustment in respiration is destroyed, and he cannot avoid failing in his enterprize.

"In order still further to illustrate the necessary condition of the respiratory organs, for allowing the continuance of powerful muscular exertions, I may remark, that the various contrivances which are resorted to for effecting this purpose, all act by limiting the inspirations, and thus preventing such a degree of distension of the air cells as would impede the ready flow of the blood from the pulmonary arteries into the pulmonary viens. Hence, in running a race, it is found essential that the mouth be kept shut, a sufficient quantity of air entering by the nostrils for the arterialization of the blood; and experience having taught, that if any additional quantity is inspired by the mouth, the proper balance between respiration and circulation is more or less destroyed, and the person obliged to discontinue the effort.

"The common practice, when running, of putting a pebble in the mouth, by the effort of retaining it, keeps the mouth closed. An animal, at full speed, it will also be observed, has the mouth always kept shut, either until his muscular powers begin to be exhausted, or when,

from alarm, he inspires by the mouth; so that whenever an animal which is pursued opens its mouth, it is well known that he cannot long sustain his speed.

"In like manner for limiting the inspirations, not only does the man, who runs a race, keep his mouth shut, but he also places his arms close to his sides, with the forearms in a state of flexure, firmly contracting all the muscles. Artizans also, whose avocations require a great muscular effort, are in the habit of tying a belt round the waist, thus preventing too great an expansion of the chest; and when the sailor prepares himself for battle, in order the more powerfully to exert himself at the guns, he ties a handkerchief firmly round the waist, by which, during the excitement of the fight, as well as the powerful muscular exertions which he is compelled to make, the movements of the respiratory apparatus are confined within certain limits, and he is prevented from making such full inspirations as would disturb the balance of the circulation within the chest.

"The pernicious effects of violent exercise on the circulation, as well as the mode of avoiding them, are well understood by those who professedly train persons for gymnastic exercises; and it is by them considered a great nicety in the process of training, never to allow pulmocardiac congestion to be carried so far as to render the thoracic viscera unable to remove

without difficulty, whenever the muscular exertions, which produce the congestion, have ceased, all surplus blood from the pulmonary vessels. For when attention has not been paid to this circumstance, and when, from an over distension of the air cells, the congestion has exceeded certain limits, an imperfection in breathing will continue, which in some instances prevents the person from following such exercises, even throughout life."

Dr. Wardrop does great honor to a number of Gymnasiarchs, in supposing them acquainted with the importance of equilibrium between circulation and respiration, and muscular movements. The error of Colonel Amoros, who thinks to do well in combining exercise and singing, appears to us to be clearly proved. This gentleman is right, in saying singing animates soldiers; it does more, it intoxicates them, as the movement of the waltz intoxicates ladies; and the excitement of the bar, the orator; and of the stage, the actor; and, according to the expression of the poet, the Arab is intoxicated while galloping across the boundless desert. But this intoxication is not desirable in the physical education of children. Whatever greatly increases the quantity of arterial blood, and draws it to the heart and brain, must produce analogous effects, and should be avoided; particularly when children have not those strong constitutions which seem to set every thing at defiance. Singing we consider an

excellent exercise for the muscles of the chest, and as a means of giving strength. We shall again refer to the utility of singing, as the means of developing the lungs, but without exercising the arms or legs. Rythme may and should be employed as the means of regulating the movements; in anormal organizations it will be found more advantageous.

The elementary exercises consist, as we have said, in different movements of the thoracic and abdominal limbs. To raise the arms, bring them forward, lower them; to raise the feet slowly or rapidly; bending the body either to the right or left: such are the elementary exercises which might easily be explained more fully were not the details fastidious.

Equilibrium.

In all these exercises the body remains erect, according to the laws of equilibrium. If we endeavour to balance with one hand any thing that is in danger of falling, we find prompt, judicious, and dexterous, movements and bendings of the body requisite; by this hardihood, presence of mind, a justness of the eye, are exercised, and the body acquires a readiness at avoiding a fall, by leaping.

Exercises of equilibrium commence by standing alternately on one leg. Standing on two legs, the

centre of gravity of man passes through the last vertebral column of the lumbar region, and falls vertically between the feet, on the basis of sustentation. The least movements change that centre of gravity; it is never fixed, either in walking, moving, or leaping.

The exercises of equilibrium may be easily diversified, with or without weights. The body bends forward on one side, according to the weight it bears, and according to the part on which this weight is supported.

In gymnastics, balancing on the edge of a plank, standing or walking on a pole, on a rope or ladder, are exercises well calculated to obtain the development and agility of the body. Walking on stilts, and skating, are exercises which demonstrate the advantages of equilibrium.

Franks says, "it would be advisable for skating to be introduced into universal practice; as he knows no kind of motion more beneficial to the human body, or more capable of strengthening it." "The Dutch ladies," he adds, "have sufficient energy to brave the frost with agile fortitude; while our tender things sit at work, in close rooms, by the fire side."

We are not of the number of those pusillanimous beings who, in the use of exercises, see only falls, fractures, and sprains. We think that if children were properly taught to use stilts and skates, the exercise would be very good; but in schools there is seldom the facility for

practising; and whatever is not properly taught, is better left undone.

"Balancing extraneous bodies," says Salzmann, is a very amusing and beneficial exercise." To prevent the object falling, we spring to the right, to the left, backward and forward, and bend the body in a thousand different ways, with a promptitude scarcely to be acquired in any other manner. At the same time the accuracy of the eye is exercised, caution and attention are excited. We have no need to call in professors of the art to instruct us in dangerous modes of exercising; all we require is very simple. To support a six or twelve feet staff, heavier at the top than at the bottom, in a perpendicular position, upon the hand, upon the finger, and shift it from one finger to the other, is sufficient; with this the balancer stands still, walks, runs, sits down, and rises up, while he endeavours to preserve it from falling, by a thousand various attitudes."

Running.

The laws of motion, applied to man, give rise to different exercises, consisting in walking backward or forward, ascending or descending; the step is slow or fast. Running is continued jumping, during which the body is active, and we may say suspended; it is but little suited to girls, and not good exercise for all boys. When

children complain of a pain in their side while running, it is a warning not to be neglected. In a gymnasum, running is performed either with or without weights.

Dr. Londe says, that running backward does not accelerate the circulation as much as walking forward; and that it throws back the shoulders, expands the chest, and greatly contributes to improve its malformation. Colonel Amoros thinks that running backward is very useful for consumptive people.

Without depreciating the opinion of these two authors, we may be allowed to doubt such happy results. Running backward or forward giving more or less activity to the circulation and respiration is not desirable for consumptive persons, or those affected with palpitation of the heart.

The running in such vogue among the Greeks and Romans, has lost its celebrity and importance, since mechanical industry has increased the means of passing with extreme rapidity from one place to the other. The progress of civilization has diminished the value and merit of running, so much estimated among savages and the ancients.

To run well, the legs must be carried forward, the head and shoulders thrown backward, so that the upper part of the body being steady, the respiratory functions may be increased; the hands and arms should remain quiet, the legs

not too much bent; if the feet be raised far from the ground, running cannot be kept up long. Healthy and well-constituted respiratory organs are necessary for running. Dr. Wardrop's observations we have given, are well adapted to running, and his recommendation to keep the mouth shut, and moderate respiration, are of real importance, and justified by facts.

Leaping.

Leaping was one of the five exercises which, among the Greeks, were considered as contributing to speed and agility; it is considered as one of the best gymnastic exercises; it strengthens and gives elasticity to the feet, legs, thighs, knees, and indeed, the whole frame; it braces all the muscles, invigorates the courage, improves the faculty of measuring distances by the eye, and gradually imparts such a command over the whole body, that there is but little to fear from a fall; and it adds resolution to the character as children grow up.

Leaping is divided into simple and composed; simple leaping is again subdivided into vertical and horizontal. Simple leaping is performed by the mere contraction of the muscles of the body, which finds support on the soil, and by means of the feet. The composed leap is that in which the hands serve as a support, by means of a pole.

A preparatory exercise for leaping among the

Greeks, was hopping, which consists in lifting each foot alternately, without stirring from the place; by raising two feet at once, with a quick jerk, or hopping on one leg; these exercises resemble those practised by skipping over a string or rope. Colonel Amoros has termed these exercises elementary.

A proper place should be selected for children to leap in; an open field is preferable: when in doors, it is practised over leaping posts, with holes to receive a straight rod, which can be raised at liberty; the bar or rod is not fastened, so that it affords no obstacle. In many instances, a string, having a leaden weight fastened to each end, is preferable.

The exercises are, the standing jump, and the running jump; the leapers first raise their feet and knees in a straight direction, not separating the legs; the body should be inclined forward, the run not too long, and in coming to the ground the fall should be not on the heels but on the toes and soles of the feet. This last observation is an important rule, applicable to nearly every kind of jump without exception. Leaping admits of great varieties; an apple may be suspended over the bar, the hands of the leaper may be loaded, he may have dumb bells, or rather small bags filled with sand. *Vaulting* consists in placing one or both hands on a fixed object, and throwing a leg over it in leaping, or else throwing both legs and the body over it; this exercise is justly considered as a part of horsemanship, and

must not be omitted in physical education. Leapfrog consists in leaping over children, having their hands placed on their knees, and standing in a bent position; children should be nearly of the same age and strength.

With a pole a child may leap in height from the ground, or from an elevation in length and depth; in all these exercises the pole must be from seven to ten feet long, not heavy, and sufficiently strong to support the weight of the leaper. He must generally turn himself round in leaping, describing a semicircle, excepting in the leap in length.

Leaping necessitates the action of the muscles of the legs, thighs, abdomen, chest, and back; in leaping with a pole, nearly all the muscles of the body are more or less contracted. It requires a certain degree of strength, and although Dr. Londe thinks these exercises desirable for lymphatic children, we do not consider them strong enough to leap with a pole, unless their constitution has been previously strengthened by less difficult exercise. In touching the ground the leaper must always bend the articulation; in leaping, the retention of the air in the chest diminishes the weight of the body, and the dangers of commotion.

Dr. Londe has justly condemned jumping from a great height, it being followed by serious commotion of the brain. The physician called to attend patients after a fall, must be well aware

of the effects on the brain, and therefore, disapprove of any violent exercises.

Parallel Bars.

These exercises, which may be considered as elementary, are useful for the development of the thoracic limbs; they form a kind of intermedium between the simple elementary exercises, and those in which the whole body remains suspended in a trapezium. With bars, strings, and rods, children may keep the body suspended; the exercise is difficult, and children do not stand long. These exercises not only strengthen and develop the thoracic limbs, but increase the capacity of the chest; they are often employed in orthopedic gymnastics, in order to extend the ligament and intervertebral cartilages, which are unequally depressed in spinal deviations. Weak children, and beginners, do not remain long suspended by the arm, but soon acquire strength by exercise: when they can support themselves, they make progress on the bar, or on the rope, so that each arm alone supports the weight of the body alternately; sometimes the ropes are stretched, sometimes they are loose. When children have acquired a certain facility and strength, they learn to climb.

Climbing.

To strengthen the body, fortify the courage, and increase the truly useful capacity of escaping

from various dangers, "climbing," says Salzmann, "is one of the most advantageous exercises, and when taught by due gradations is less dangerous than riding on horseback, or in a carriage."

Frank thinks that climbing tends greatly to promote bodily activity in boys; he says "that were youth only to be familiarized, under good guidance, with various dangers not always to be avoided in common life, and to learn the great art of preserving the balance of the body in all cases, much would be gained. Children would become habituated at an early age to dangerous situations, and be secure from that dizziness, which is often fatal to many in the occurrence of danger."

"Nature," says Salzmann, "has bestowed on us very safe and sufficient implements for climbing, in our hands, arms, legs, and thighs." We must begin by strengthening them, before we venture on the practice of climbing itself.

Children have the arms strengthened by the exercises of the horizontal bar, under which they remain suspended as long as they can. The legs have been previously strengthened by the exercises of walking, running, and leaping.

Children begin with poles of different size, generally with the slender trunk of a tree. The mast is difficult to climb, on account of its smooth surface. The rope ladder is still more difficult; but before climbing masts, poles, and rope ladders, children must be used to climb fixed

wooden ladders in different ways. The single rope, without knots is more laborious than any of the exercises yet named. Exercises may be diversified with poles, masts, ladders, ropes; but when the least giddiness is felt, a child must not climb to the top.

The exercises of the trapezium were introduced into gymnastics by Clias. Although this celebrated gymnasiarch had proclaimed it the best of his inventions, we may say that it is but a variety of the exercise of hanging by the hands, and it is found of great use.

The exercises here described were all made in what was called the portique among the ancients. The portique was in reality the reunion of all the best means of useful and inoffensive gymnastics; ladders of different kinds, ropes, knots, masts, poles; and many of the exercises of the portique are equally adapted for girls, in order to prevent accidents, which may occur in every-day life. Where is the lady who, in going from one boat to another, may not have to climb up a ladder? It is a useful exercise, and one we strongly recommend. It is difficult to find a gymnastic machine more useful than a portique; its form, the diversity of the instruments, the variety of exercises, are of the greatest utility. Colonel Amoros has introduced another machine in the gymnasia, offering all the advantages of the portiques, but not at all adapted for young ladies.

Wrestling.

In all the preceding exercises, children exercise their muscles on inanimate objects, the resisting power of which is all the same; but as progress is made, the strength should be tried with animated beings. Wrestling and equitation resume most of the exercises already described; and when children can walk steadily, and the equilibrium is well maintained, they may then wrestle without fear. Take two children of the same age, and of an equal degree of strength; the one not accustomed to exercise, the other having followed a course of gymnastics, and it will soon be evident which of the two combatants has the advantage. No animosity nor jealousy should be allowed to exist, and wrestling should only take place between boys of the same physical powers.

"One of the advantages of wrestling," says M. Amoros, "is the exercise given to the whole body; there is pressure, impulsion, repulsion, suspension, so that all the muscles of the body are exercised in wrestling.

Throwing,

Is an exercise which strengthens the hands, the arms, the shoulders, and pectoral mus-

cles: when combined with aiming at a mark, it exercises the eye. The ancients were much accustomed to throw darts; it was a part of military education: the bow and arrow were also much used, and promoted as an amusement; the skittles or nine pins, have been substituted for the discus, and shooting for throwing darts; but shooting requires few muscular movements, and does not contribute to strengthen the body, but to exercise the eye.

Slinging, or casting stones with a sling is a dangerous game, and should be prohibited in all schools. There is no objection to the game of quoits.

Hand ball or palm play is free from danger, and may be of use to give agility to the body, and quickness to the eye; the balloon or wind ball is still more simple, and suited to both sexes: there are different plays with balls all having the same result or tendency; they may be useful, but having no regulation, they do not contribute to the regular development of the body.

Dancing is one of the most useful exercises of the body; we shall speak of it in the gymnastics of young ladies.

Fencing is an exercise that may be useful not only to develop the muscles of the body and increase the strength, but to teach man to protect himself when attacked; fencing should form part of a well directed education.

When boys have followed the exercises in which they may with skill avoid every danger, it will then be desirable for them to go to a riding-school, and thus have an opportunity of repeating all they have previously learnt; jumping, climbing, opposing the power of the muscles to the resistance of the horse, by keeping in the rein; in short, riding shews the awkwardness of a bad education, or the pliancy of a well bred gentleman.

Rowing a boat is one of the best exercises for strengthening the muscles of the body, and this knowledge is always desirable for the inhabitants of an island. There is at Eton College an annual boat race or regatta; if this custom be well directed, it will be found an excellent gymnastic exercise.

Natation.

"When an individual has apparently lost his life by drowning, says Salzman, "we think highly of his restoration, and not without reason.

"Institutions for the recovery of such of our unfortunate fellow-creatures are established in various places, and instructions for the purpose are liberally dispersed. Let us then act consistently. Surely to secure the health of millions is of far greater importance, than to recall to life a few individuals.

"For my part, I consider the cold bath as an essential object in a good physical education, and a bathing place, as an indispensable appendage to a public school. A particular building, for the purpose, however, is unnecessary; a safe, retired spot appears to me sufficient. Were children permitted to bathe in such a place, under proper inspection, they would have no temptation to evade the father's eye, and fill the mother's heart with alarm. How many promising youths are annually lost to their country, merely from the want of such institutions!

"No doubt I shall have many ready to start objections here; such as, bathing is not every where practicable, because water is wanting: who will take upon himself the charge of superintendance? who will defray the expense of bathing dresses? These and similar objections only show, that men do not take up the matter in earnest, and consider education, properly so called, as far as tuition is out of the question, with an indifference little to their honour.

"The advantage which youth would derive from the cold bath, is not difficult to comprehend. I say expressly the cold bath: I would not employ for the purpose the water warmed by the sun of a summer afternoon, but the much cooler stream of the early morning. This braces every muscle, and every nerve; imparts to the body a powerful capacity of supporting cold; steels the skin, on the tensity or laxness of which so much

depends, against the influence of the air, and renders it fit for the exercise of its natural function, perspiration; refreshes the whole system, gives alertness to the body, an animation to the spirits, and is particularly serviceable for cooling the blood in the heat of summer.

A clean, firm, undebilitated skin, is requisite to health, and this is best preserved by bathing. How desirable then must it be to the poor and labouring class, to have it in their power, to frequent a cold bath at little cost, or, which is still better, at the public expense!

From bathing to swimming the transition is easy. Our pupils shall be kept diligently to their bathing, that they may learn to swim in the mean time. To be able to preserve the life of a fellow creature is surely a matter of exquisite delight; but what avail injunctions, excitements, or public rewards, for rescuing a man from a watery grave; or what the strong impulse of our humanity, when we are obliged to run about in quest of that assistance, which we do not possess in our faculties? Nay, if it were possible that we could regard our own safety alone, the utility of the art is too obvious to need further recommendation.

The Athenians, when they would express the idea of a man's knowing nothing, and being fit for nothing, used to say, that he could neither read nor swim. All beasts can swim, therefore

swiming is no art, but a natural faculty of the animal body, which the creator bestowed on it, because he knew it must be frequently exposed to the danger of falling into an element so generally abundant. Man only, or rather the polished European, cannot; partly because it never enters into his mind to attempt it, partly because the natural faculty, is more or less destroyed by the physical treatment of his youth. This is a serious charge, because it includes with the annihilation of this faculty, a number of diseases of the thorax, by which multitudes are sent to the grave.

"Scarcely is the infant come into the world," says Salzman, "when his chest is compressed. This vile fashion does not cease here; our usual dress, fastened across the breast, is a continuation of it. In this do we not act diametrically opposite to nature? She would have our body obey its innate propensity to enlarge, but we confine it by our clothing. The breast bone and ribs are at first mere cartilages, and should extend with the growth: the encreasing lungs should contribute to this by the act of respiration, enlarge the cavities of the thorax, and assist in forming that beautiful arched chest, which is commonly observed in strong persons. But this we counteract, and acquire a form very different from that of the son of nature. The diminution of the chest in consequence, is the occasion of many diseases of the thorax, as well as of greater difficulty in acquiring the art

of swimming. Practice must supply what we have lost, and to this I now proceed.

"I cannot here omit the testimony of Dr. Franklin, who was an excellent swimmer, as it is given in the words of Campe. 'Nothing, in fact,' says the latter, 'can be easier than learning to swim. Little more is necessary, than the persuasion that you can swim if you will. This I was taught by the celebrated Franklin, see his letters, when I was six and thirty years old. On his authority I made the trial, and succeeded. He says, 'All men can swim as well as all beasts: nothing more is requisite, than to have the courage to put yourself into a proper position, and make the same motions with your hands and feet as you see the frogs. But this courage you will not have, till you have found by experience, that you can keep yourself afloat in this manner. To make this experiment, walk into the water, where it deepens gradually, till you are up to your middle, and turn about your face to the shore. In this situation you will not be afraid to throw yourself forward, and imitate the known motions of swimming, because you are certain that you can soon reach the ground, and raise yourself up whenever you please. Thus you will soon find, that water has the power of supporting you: you repeat the trial, and every time your confidence increases: you gradually venture further and further from the shore, and thus the swimmer is formed.

"1. The learner should be accustomed frequently, to plunge the whole of his head under water: at first this gives a kind of stunning sensation; for which reason it is very necessary to be perfectly familiarized to it, as in first learning to swim it will unavoidably occur. But it should be carried further; the learner should try to swim under water, and keep himself under as long as possible. With this view I have found it very advantageous to draw as much air into the lungs as possible, immediately before diving, and let it out again slowly, under water.

"2. If the water reach a little above the hips, it is deep enough for swimming. The whole of the place intended for bathing should be accurately examined; and it would not be amiss to drive in stakes, as a warning against the deeper places.

"3. It is likewise necessary to have a guide, who, if he cannot swim, is not afraid of the water, and may support beginners with his hand, placing it under their belly opposite their short ribs, that they may learn to move their legs and arms without fear of sinking.

"4. When the learner has acquired some expertness in this, and the guide feels that he bears less upon his hand, a cord should be fastened to a belt passing round the body at the arm pits, and while the guide has hold of the end of this, he should go on till the water is up to his neck, or even till he is out of his depth. Here he will exert his powers, and commonly

learn to swim in a short time. I have seen ten or a dozen boys, who had practised swimming with the support of the guide's hand for some months, or even years to no purpose, who were thus rendered swimmers in a few lessons.

"5. In swimming on the belly, the body lies in an inclined position, the feet being deepest, and the head being thrown back, so that the chin is above the water, while the eyes look forward along its surface, not down into it. Neither the hands nor feet should come out of the water. The fingers and thumb of each hand being close together, and the elbows bent, the two thumbs should be brought into contact, or the hands laid one upon the other, and thus keeping the surfaces in an horizontal position, they should be thrust forward as near the surface of the water as possible, till the arms are extended in a straight line. At this point the hands should be turned so as to be nearly perpendicular to the plane of the horizon, the thumbs being downward, and the fingers being very slightly bent so as for the inside of the hand to form a trifling hollow; and in this manner they should be moved in a curve, first outward and then backward. While the hands are pushed forward, the heels are to be drawn up toward the buttocks, either keeping them close together, or which is the practice of the best swimmers, crossing the legs at the small, and while the hands are moving outward

and backward, the feet should be moved outward and backward likewise; the soles pushing against the water, till the legs are brought close together in an extended position, which finishes the stroke. The same proceeding is to be repeated as often as you please; taking care that the hands and feet move regularly, slowly, and at the same time: by the first, their effect will be more uniform; by the second, less fatiguing; and by the third more forcible.

"6. In swimming on the back, likewise, the body is in a slightly inclined position, the feet being lower than the head, and the face alone being above the water. The arms being laid along close by the sides, to increase the surface of the body; the knees are to be drawn up till they make a right angle with the body, keeping them close together, so that they will appear above the water. This is the preparation for the stroke, which is to be given by separating them from each other, and pushing against the water with the soles of the feet, in the same manner as in swimming upon the belly.

"This mode of swimming is very commodious when the swimmer begins to be fatigued, as the arms are perfectly at rest; a considerable interval may be allowed between the strokes with the feet, as the body remains suspended in this posture for some time, the feet sinking very gradually. If you want to rest the legs,

you may keep yourself afloat, by lying on the back as nearly as possible, in a horizontal position, and moving the hands on each side in very short but pretty quick strokes, holding them in the same position as when you swim on the belly."

If a person should be seized with the cramp in the leg while swimming, Dr. Franklin recommends, while thus lying on the back, to lift the leg out of the water, and give it a sudden, vigorous, and violent jerk in the air.

"Treading water, as it is called, is another mode of resting. To perform this, the swimmer suffers his feet to sink till his whole body is in an erect position, and then he raises his feet a little way, and depresses them alternately, as a man does when he sets any machinery in motion by means of two treadles; at the same time moving his hands up and down in a similar manner, just before him, the elbows being bent.

"When a person is tolerably expert at swimming, it will be highly advisable for him to practice, occasionally, with all his clothes on, as he will, most probably, be in this situation, if at any time he should fall into the water by accident. My teacher never swims without a linen jacket, and long trowsers; and he assures me, that he can swim in his great coat and boots.

"Young persons, after they are capable of swimming, should practice leaping into the water from

considerable heights, since this may beuseful to them in various cases. In this, no farther instructions are necessary, than to begin with little heights; take care not to fall on the belly; and if you leap in head foremost, to protect the forehead from the stroke of the water with one hand. It is safest likewise to keep the legs close together."

CHAP. XXVI.

Gymnastics for Young Ladies.

INSTEAD of feeding children delicately, flattering them incessantly, or falling into another extreme, and finding continual fault; keeping them confined to their seats, and not allowing them to speak, or move; let them, says Rousseau, have substantial nourishment; let them run and play in the open air, and enjoy their liberty. We have so often shewn the influence of physical agents—air, light, heat, exercise, on growth, that repetition would be useless. The observations we have made on the advantage of exercise and gymnastics, are applicable to the education of young girls; only it is well to appropriate these exercises to their age and strength.

Gymnastics for young ladies should not be reduced to mere mechanical movements of going backward and forward with a wand, or Indian sceptre; there are innumerable circumstances in life which necessitate dexterity and self command. A young lady may, during ten years, learn to move the Indian sceptre, and would yet feel timid and awkward in going up a ladder. The chief object of education, both for boys and girls, is to prepare them for all the occurrences of social life. We do not in our course of gymnastics, approve of any violent exercise, leaping from a great height, or scaling walls; but we recommend all those exercises that may strengthen the body, while they add to the grace and beauty

of the figure. Walking does not alone suffice for the full development of the limbs. Dancing is certainly an excellent exercise, but its utility is mostly confined to the legs. We are desirous that young ladies should make use of their hands; wands, dumb bells, Indian sceptres, are not sufficient to improve the figure; they are rather suited to automata than to living beings.

Exercises may be divided into exercises of the hands and arms, either separately or together; exercises with the rods, dumb bells, Indian sceptres, horizontal bars, ladders, &c. Some are performed standing, others walking; the slow walk, moderate and quick pace, stepping backward and forward, are the elementary exercises, which may be diversified in various ways.

Methodical Exercises.

Whatever system may be adopted with regard to exercises, it is essential to place the body in such a condition that there may be no restraint on the muscles. In order, therefore, to derive full advantage from gymnastic exercises, it is desirable for young ladies not to wear stays during the performance of these exercises.

We have already said, that standing upright calls in action nearly all the muscles of the body: when children have a good constitution, and are free from hereditary or acquired disease, or that sudden growth which so often destroys the equilibrium of the organs and functions, all

the muscles in the body may be exercised, commencing by the upper parts, and then the lower ones.

Exercises of the Arms.

We have been called on to examine several exercises that we refrain from recommending, as they appear to us very improper, and prove total ignorance of the laws of the organization and the action of muscular exercises on the body. Instead of exercising the muscles, having the same action, in a manner consistent with their natural inclination, they are exercised in a contrary direction, as if the object was to destroy the *ensemble* and harmony of the organs.

Nearly all authors agree in attributing the deviation of the shoulders to want of proper attention to the mode in which the hands and, arms are used. The inferior limbs being destined to move one after the other, the conformation of the lower part of the body is purposely adapted to resist the power of this alternate action; but the hands were meant to move at the same time, notwithstanding the universal habit of making greater use of the right hand, for drawing, writing, and various other employments.

It appears desirable for young people in the normal state, to exercise the muscles in the same direction; as in early age deformity is soon produced, and extreme care is necessary to its prevention. The following exercises are much in use.

First Exercise.

The arms in their natural position, hanging down by the side, the thumbs turned outward; to be raised horizontally to the height of the shoulder, then gradually let down; by which movement all the muscles of the chest, the sternum, and sides are extended. This exercise may be varied in divers ways; bending the arms, for instance, and bringing back the hands to the top of the shoulders.

Second Exercise,

Consists in swinging the arms to and fro, either with the hands open or shut.

Third Exercise.

Raising the hands above the head. As this exercise sometimes causes pain, we place it thirdly.

Fourth Exercise.

The rotary motion of the arms forward, which may be compared to using a hand mill, from right to left, and left to right.

Fifth Exercise.

The same movements to be performed walking.

Sixth Exercise.

To bend the body forward gently, so as to exercise the vertebral column.

We strongly recommend to young ladies, to bend the whole body in the different attitudes represented by those beautiful models found in all museums.

Exercises with Wands.

First Exercise.

Raising the wand above the head, stretching out both hands.

Second Exercise.

Bringing the wand down nearly to the shoulders.

Third Exercise.

Bringing the wand down behind, and walking in this attitude.

Exercises with the Alteræ or Dumb Bells.

The dumb bells were used in gymnastics among the ancients, and have been long in use in England These instruments may not only give flexibility to the muscles, but also strengthen them. Donald Walker says, that dumb bells should not weigh more than from three to four pounds each, for children from six to ten years of age; and from four to six pounds each for children from ten to fifteen years old; this classification does not suffice. Dumb bells ought never to be employed by weak children, nor by those in whom there are scrofulous predispositions; as in these circumstances, the weight of the body should not be increased. The same author has presented a new instrument, which may supersede the other, and which he calls the Indian sceptre.

We certainly prefer the Indian sceptre to dumb bells: it might prove serviceable to boys; and

under the direction of a clever master, children could be taught from this sceptre, all the advantages to be derived from a lever; and young ladies can also learn to study the laws of equilibrium. These sceptres must not be too heavy; it may be useful for girls to be accustomed to carry different objects, in order to remove the fear they seem to have when they take up any thing brittle.

After passing through the exercises, walking, the Indian sceptre, and wand, they may proceed to the exercises of the portico; not the same as those practised by boys, but those of a more quiet nature, suited to the age and strength of the pupil. It is desirable for a lady to go up a wooden, and even a corded ladder; it is desirable that she should be able to make use of her hands, hold a rope, mount a horse; that she should pass, without fear, from one vessel to another, maintain her equilibrium in a small boat, crossing a narrow river; that she should walk steadily on a plank placed over a ditch; that she should swim. Well directed physical education should foresee the common accidents of life, and consequently shew in what manner they are to be avoided.

The gymnastics we recommend cannot be compared to those practised in Lacedemonia, where young girls wrestled in public, and swam across the Eurotas; neither are they similar to those of Clias. Parents have no cause to fear that

their children's muscles will be too much developed, as was the case with Calesthenic exercises; the disadvantages of which we have already pointed out in a previous chapter. In a gymnasium, directed by a medical man, it cannot be supposed that he will only observe one part of the human frame, and develop the muscular strength to the prejudice of the whole body. The contents of this work shew that, in our own practice, we have given special attention to preserve the beauty of the figure, and prevent awkwardness; for grace is one of woman's chief attractions.

We do not foresee the circumstances in which it may be necessary for a female to climb up a mast, and, therefore, we say nothing of these exercises for girls; our object being to prepare them for the numerous accidents of life, and not to adapt education to an exception.

Exercises on a Wooden Ladder.

However easy this sort of exercise may appear, it is, nevertheless, useful to lay down rules that may make it more certain. The feet should be placed on the broadest part of the steps, and the legs touching the perpendicular bars of the ladder, on which the hands should be placed, for then, supposing the horizontal bars were to reak, the hands could still support the body,

and there would be no fall; besides the chest is more expanded, and may be more easily dilated when the arms are extended. The right hand and foot must move at the same time, then the left. This exercise is very easy, and at the same time free from all danger, if the ladder be slightly inclined.

There are different sorts of exercises with the ladder, to be used according to the judgment of the teacher; it may be useful to go down a ladder on both sides, in cases of fire, and it is always well to carry a small basket on the head, or any light weight, in order to keep the body erect.

After learning to go up and down a wooden ladder with steadiness and agility, rope ladders are then used for practice; every lady may be under the necessity of climbing a rope ladder to go on board a ship. During the first lessons, ladders should be fixed at both ends; later, one end only need be fastened. Climbing a knotted rope is an exercise not suited for young ladies; going up a pole is equally unfit for them.

We know all the advantages the learned Delpech derived from gymnastics; but Delpech had to cure deviations, and those exercises that we cannot recommend for the regular development of the muscles of the body, may be found very useful in cases of deformity; we, therefore, refer to medical gymnastic, or orthopedia, or exercises on slanted cords, swinging, &c. But climbing masts we wholly disapprove.

There is, however, a gymnastic instrument introduced by Clias, and used in gymnastics for boys, which is well suited for young ladies; we mean the triangle, on which suspension may be maintained for some time; the arms are strengthened, the chest expanded, and there is not the slightest danger to be feared, unless wonderful feats are expected; such, for instance, as are recommended by Clias. Delpech highly approved of the triangle.

Some of our observations on equilibrium are adapted to girls as well as boys. There are many excellent gymnastic games productive of benefit, if properly played, and the attitudes taken be graceful, and free from all violence. Skipping backward, balls, *les graces*, are nice useful amusements; but dancing is, of all exercises, best suited for young people; it comprises all elementary gymnastics.

Natation.

It may be thought strange, that in a work principally intended for the physical education of young ladies, any observation on swimming should be made, for where prejudice exists, it is difficult, if not impossible, to remove it; however this may be, many of the remarks on natation made in the chapter of gymnastics for boys, are equally applicable to gymnastics for girls. Young ladies have been required to pursue a course of exercises neither suited to their strength nor

sex; had they been destined for soldiers or wrestlers, the case would have been different. One extreme made room for another, and Walker's exercises, which consist in raising and bending the arms like puppets, were substituted for the violent gymnastics introduced by Clias. Utility has not been considered, or swimming would have long since formed part of the physical education of young ladies. Suppose, for instance, an accident at a water party, a shipwreck; or fancy a mother seeing her child fall into the river, maternal instinct leads her to rush in, and try to save it, but mother and child perish, for the education of the parent was imperfect; and but for this, both might have been saved. It is much to be regretted that, in most large towns, there is not a private *Naumachia*, where young ladies might learn to swim, and develop all the organs of the body; Clelia crossed the river, followed by her companions.

In Italy the ladies swim at a short distance from the shore; they have a dress made for the purpose; the head only is uncovered, the hair is left to play on the waves, and there are very few sights that offer a greater degree of interest. Swimming might be learnt privately, in places specially adapted for the purpose. Diana bathed in the sea, and the ancients, who deified all they brought forward, either as precept or allegory, meant thus to indicate, that the goddess of chastity not only practised the gymnastics of

hunting, but also that of swimming. Cold baths, so refreshing during the summer, would be much more agreeable, if young ladies were not compelled to remain standing in the water; and would be doubly useful for them to learn to avoid danger. At Paris there are two large plunge baths, where ladies learn to swim; they have on loose dresses, and would thus, in case of accident be able to swim in their clothes. Yet the capital of England, so forward in some respects, has not any public establishment of the kind!

Dancing.

The great Locke, in his treatise on Education, says, "Dancing being that which gives graceful motion to all our lives, and, above all things, manliness and a becoming confidence to young children, I think, cannot be learned too early. Nothing appears to me to give children so much confidence and behaviour, and so to raise them to the conversation of those above their years as dancing."

Lord Herbert, of Cherbury, to whom the world is indebted for some excellent remarks on the advancement of youth, states, that those who have properly learned to dance, appear to understand more what to do with themselves, and to have more freely and elegantly the use of their limbs, and command of their carriage than others, who labouring under a stiffness in their motions, seem as though they were taken in the

joints, and appear not to be capable either of sitting down, rising up, standing, of walking, in a manner that is agreeable to the eye of taste. He also observes, that those who have been taught by the more accurate dancing-masters, enter and quit a room, where company is, and address themselves to persons, both above and below their own stations, with far more grace and propriety than those who have not had similar advantages.

In Fordyce's Sermons to Young Women, the author observes, "that he must acknowledge he can see no declamation against the moderate and discreet use of dancing." "I freely confess," he adds, "that I am one of those who look on with a very sensible satisfaction, well pleased to see a company of young people joyful with innocence, and happy with each other. If an exercise, so sociable and enlivening, were to occupy some part of that time which is lavished on cards, would the youth of either sex be losers by it? I think not. It seems to me, there can be no impropriety in it, any more than in modulating the voice into the most agreeable tones in singing; to which none, I think, will object. What is dancing, in the most rigid sense, but the harmony of motion rendered more palpable; awkwardness, rusticity, ungraceful gestures, can never surely be meritorious."

The Spectator is also an advocate for dancing: he says, in one of his papers, "it may appear

odd, that I, who set up for a mighty lover at least, of virtue, should take so much pains to recommend what the soberer part of mankind look upon to be a trifle; but under favour of the soberer part of mankind, I think they have not enough considered this matter, and for that reason only, esteem it lightly. I must also, in my own justification, say, that I attempt to bring into the service of honour and virtue, every thing in nature that can pretend to give elegant delight. It may possibly be proved, that vice is in itself destructive to pleasure, and virtue in itself conducive to it. If the delights of a free fortune were under proper regulation, this truth would not want much argument to support it; but it would be obvious that there is a strict affinity between all things that are truly laudable and beautiful, from the highest sentiment of the soul to the most indifferent gesture of the body. The business of dancing is to display beauty; and for that reason all distortions and mimicries, as such, are what raise aversion instead of pleasure."

Mrs. Chapone very justly remarks, that dancing is now so universal, that it cannot be dispensed with in the education of a gentlewoman; that it is, indeed, both useful and ornamental, as it forms and strengthens the body, and improves the carriage.

Some German authors, among whom we may mention Wolf, Waltzler, and Neut, have puri-

tanically considered dancing as contributing to the degeneracy of the species.

We beg, in the first instance, to assert, that notwithstanding these modern Heraclites, and their melancholy opinions, we do not believe that the human species have degenerated. This theme is worn out; our wives and daughters are not less beautiful than the Romans and Grecians; Canova's graces had cotemporary beauties as models. In England, women have always been distinguished by the appellation of the Georgians of Europe, and are by no means inferior to those beauties, that Rome, triumphant and mistress of the world, sought with so much eagerness in its slave market.

Dancing, to be healthy, and conducive to the development of the figure, must be as distant from the pyric of Sparta, as the wonderful performance of Taglioni and the Esslers; the former might be well adapted to the robust Lacedemonians, the other could only suit opera dancers, and Terpsichore shining in a ballet.

Among the Greeks, dances were numerous, and varied. In all their institutions there was dancing; in warlike exercises, religious ceremonies, weddings, and other feasts.

Dancing has lost that religious character existing among the ancients, and is now only considered as an amusement, freed from all superfluity rendering it irksome. The manner in

which dancing is now taught, differs but little from walking, and would serve as a useful gymnastic, well suited to females, were it not carried to excess, and allowed to become a passion.

The movements used in dancing quadrilles are more graceful than laborious, more light than fatiguing; and as there is no call for exertion; this exercise may be very useful to young people. That the movements of the hands, arms, and the whole body are beneficial, fashion and reason seem to agree. Jumping is no longer admired; and over exertion, and unbecoming activity are considered as characteristics of vulgarity; the gravity of the age seems even to have penetrated the temple of Terpsichore, and the galopade, with its hurried steps, its rapid time, can have but a temporary success. A good dancer is always graceful; she is upright, though not stiff; light, but not precipitate; all her movements are elegant; she scarcely touches the ground, yet always maintains her equilibrium.

A practical author says, "that the carriage of the arms is certainly one of the greatest difficulties in dancing; it, therefore, demands the utmost attention on the part of the pupil. Of all the movements made in dancing, the opposition or contrast of the arms with the feet, is the most natural to us; to this, however, but little attention is in general paid. If any person be observed when in the act of walking, it will be

found, that when the right foot is put forward, the left arm follows, and *vice versa;* this is at once natural and graceful, and a similar rule should, in all cases, be followed in dancing; as much depends on placing the arms properly, and in moving them with grace as in the execution of steps; for dancing consists not in the motion of the feet alone, it requires the appropriate accompaniment of the arms and body; without which the art degenerates into a mere fantastic mode of stepping. The arms should be kept in an easy semi-oval position, so that the bend of the elbows be scarcely perceptible, otherwise they would present right angles, which would so offend the eye, as to destroy all appearance of ease or elegance. Care must be taken neither to raise the shoulders, nor to spread the arms too far out. The proper situation of the arms, in dancing, is rather in front of the body; they should advance or recede in a natural series of opposition to the direction of the feet in the execution of the various steps; their movements in performing these contrasts must not be sudden or exaggerated, but so easy as to be almost imperceptible. It is a matter of importance to overcome both tremor and rigidity of the fingers, which should be naturally grasped, so as that the palm be partially seen in front.

It is essentially necessary for the feet to be turned out, in order that both feet may attain an equal degree of execution; as it is not

only inelegant, but awkward, for one foot to be constantly in action, while the other remains comparatively still; and though neat execution of the steps is very desirable, the graceful movement of the figure is not less so. All idle attitudes must be avoided. Forcing the shoulders up to the ears, stooping or rounding the back, if long permitted, may eventually give rise to local deformities. The body should be kept in an easy and graceful position; the chest advanced, the waist retiring; by these means the breast will be naturally and elegantly developed, and the shoulders being brought to range evenly with the back, appear at their proper breadth, and form a graceful contrast to the waist.

The head should be kept continually between the shoulders; the erectness of the neck, and changing the face from the right to the left, may not only prevent constraint, but the opposition which is produced by a judicious change of the direction in which the countenance is turned to the posture of the body, materially embraces the grace of the whole figure. Children should not be allowed to dance directly after meals, or this exercise becomes prejudicial to the digestive functions, and injurious to growth; dancing late at night, in an ill ventilated room, where the dust and flue are swallowed, by fastening on the chest, give rise to considerable irritation.

However much inclined we may be to approve

of dancing as the most suitable exercise for young people, to counterbalance the effects of a sedentary life, yet we cannot avoid condemning waltzing as equally injurious to health and morals. The rapid movement of the waltz makes the blood rush to the principal internal organs, the heart, the lungs, and brain.

The *galope* is decidedly prejudicial to health; no dancer, however intrepid, can long continue the hurried movement; and we are of opinion that neither the waltz nor galope should form any part of the amusement of young people.

The dance of the mountaineers is very lively; the hands are as actively employed as the feet. In Scotland, in the south of France, in the Pyrenes, whether to the sound of the pipes, tambourine, or castanets, the rapid evolutions, render it unfit for growing girls.

Professional dancers offer specimens of deformity in all the parts of the body; the neck is thin, and the muscles that support it are stiff; the chest is narrow, the shoulders protrude, the legs are crooked, the knees turned out, and the whole distortion is so strange, that an exact description appears like an exaggeration, scarcely giving an idea of either man or woman. There is a want of harmony in the different parts of the human frame, that would constitute positive ugliness, if art did not conceal all these acquired defects.

Few persons can imagine the misery concealed beneath the fancy dresses of our opera dancers, when they have performed their part on the stage, and behind the scenes, give way to the fatigue by which they are overpowered. Few dancers could be taken as models, either for the painter or the sculptor; nearly all, have bad health; every thing with them is artificial; and those wonderful feats that surprise the public, are rather the effect of nervous excitation, maintained by public applause, than by real strength.

Complaints in the chest are generally caused by violent exertion, which injure the functions of the heart and lungs. Aneurism, cardites, pneumonia, or consumption, generally put an end to the lives of stage dancers. If these remarks do not pass unnoticed, they may be useful in shewing that dancing must, in some instances, be injurious to young girls predisposed to diseases of the heart or lungs.

The allegory of the Sylph is suited to an opera dancer; she is, in fact, the chimera, the golden shadow left for the substance. Decorate your idol, offer it incense, follow it amidst its companions, and when, at last you reach the treasure, the mask falls, and you possess a vulgar being, with an empty head, and cold heart!

CHAP. XXVII.

Observations on Gymnastic Exercises.

We have given an accurate description of the gymnastic exercises, that may be suited to both sexes, which are compatible with the usual mode of education.

The advantages that may be derived, as a means of developing the muscular powers, and giving more activity to the functions of the economy, and grace to the motion of the body, are incontestible. But will it merely suffice to recommend these exercises? Are there no considerations with regard to age, constitution, weather, situation, as contra-indications of gymnastic exercises? Is there nothing to be avoided? Is there no choice to be made, as to the means of developing either a part or the whole of the body? These questions require elucidation. We should have fulfilled our task very imperfectly, if we did not shew the dangers to be avoided, as well as the advantages to be derived.

From the earliest age children may be accustomed to gymnastic exercises. In Colonel Amoros's gymnasium, we have seen them, when only four or five years old, run up and down a ladder with the greatest facility. Our own infant goes

up a ladder, twelve or fifteen feet high, with extreme steadiness and total absence of fear. From the age of seven, appears to us the most desirable time for gymnastic exercises. As we have already said, at this period of life, children are subjected to remain some hours at their studies, confined to their seats. Weak children suffer so much from excess of application, that they have no inclination for amusement, or the legs alone are exercised; hence the superiority of gymnastic exercises over all other diversions, as the whole body is called into action.

The movements of the body are not in general guided by any rule, they have not any object. For instance, a child having a commencement of deviation, and one side of the body more developed than the other, may continue to exercise both parts of the body equally, and thus increase the inequality of power in the muscles.

If in education the importance of well directed recreations were properly understood; if instead of training children like sheep, confining them in the same fold, and leaving them to their own guidance, parents and governesses were to seek advice, as to the exercises best adapted for each pupil, we should have graceful instead of awkward girls; they would possess that ease and elegance which should ever be the appendages of a well directed education; and which, if not a gift of nature, or the result of good habits in early age, is never acquired in later life. Our

attention has been forcibly arrested, by observing an infant of three years old, prefer gymnastic exercises to his usual play-things; the child's chest had been contracted from his birth, but he had not used these exercises many months, before it was expanded; his arms have acquired great strength, and he has not had a single fall. His dexterity and grace are remarkable; he never does any thing awkwardly.

Although from seven, and above that age, is the period best adapted for gymnastics, yet they can be practised with advantage at a much earlier period; it is always desirable to make recreations useful; give children the habit of employing time well, let all their actions have good useful objects; instil into their young minds ideas of utility, and in whatever stations of life it may please Providence to place them, they will derive the benefit of the valuable habits they have been made to acquire.

We have established special gymnastics for young girls; they also require that their time should be well filled up. From the nature of their occupations, and unequal share of labour in social life, man is more than woman habituated to employment. What superiority does a female not acquire, who is early convinced of the propriety of industry, and who does not fancy herself created to spend her life in idleness! Give, therefore, a good direction to the recreations of girls as well as boys; let them learn to make

use of their hands; let them endeavour to strengthen their constitutions, naturally so weak and delicate; let exercise of the body relieve the exercise of the mind.

All children cannot derive equal benefit from general gymnastics; in cases of deviation, the exercises we have described may not be suitable; when the constitution is not in a normal state, orthopedic or medical gymnastics must be employed for children of a nervous temperament, and precocious intellect. General or special gymnastics may be recommended to counteract the effects of premature mental development; the body should be exercised, and the mind left in repose. Let the muscles be strengthened, in order to diminish the effects of nervous excitement.

To children of lymphatic constitutions, gymnastics gradually applied, may give strength and solidity to the tissues; the glands will be less swollen, the blood and lymphatic fluids more active in their circulation, cease to stagnate in the vessels, and may thus combat the predisposition to scrofula, to glandular swellings, and green sickness. In some children the brain appears in a state of stupor; it would be vain to attempt to convey to their feeble minds correct notions on any subject; they are scarcely alive to surrounding impressions, and seem lost to what is passing. It is under these sad circum-

stances, that well directed gymnastics may soothe the sorrows of afflicted parents; and that the mind may be developed by previously subjecting the body to gymnastic exercises, suited to the state of the patient; activity and precision must be combined, both will be found wanting; the perceptions are dormant, they must be brought into action; it is through the medium of external objects, it is by motion the requisite activity will be communicated to the dormant senses, and that they will attain that quickness of perception nature seemed originally to have denied.

Where are the gymnastic, fencing, drilling, or dancing masters, who have ever considered exercise in this scientific point of view? Gymnastics have been employed with success in the treatment of the insane; why, therefore, should it not be equally so in the treatment of idiotcy, particularly when children are young; and that during growth, their physical education is directed in a philosophical and rational manner?

There is no state in which young people more imperiously require gymnastic exercises, than when from excess of indulgence and sedentary habits, they have become nervous, irritable, hypochondriac, and affected by the slightest motion. When girls pass sleepless nights, are in a continual state of excitement, or appear unhappy without cause, and give way to low spirits, the good effects of gymnastics will be most forcible.

Gymnastic exercises should always be taken either two hours before, or two hours after meals; digestion should not be interrupted, neither should children feel hungry when they begin their exercises. The body must not be confined by tight lacing; it is better to practice without stays; the dresses must be loose and wide.

Morning is the time best suited to gymnastics, the limbs seem to require exertion after the repose of the night; but under all circumstances, and at all times, gymnastic exercises should be discontinued as soon as they induce fatigue; if they cause perspiration, children must not sit still, but walk up and down till the circulation becomes slower.

It is undoubtedly very beneficial to take exercise in the open air, but this is not always feasible, as the temperature is so variable; we, therefore, prefer an in-door gymnasium, for regularity is most essential to the attainment of the object in view, whether this object be merely the improvement of the figure, the cure of deviations, or the still higher object of relieving the mind.

When children begin gymnastic exercises, the arms have scarcely sufficient strength to support the body, and it is an effort to remain suspended by the hands for merely a few seconds; the muscles of the arms, the shoulders, and chest are extended, and a general lassitude ensues; if notwithstanding this feeling, the exercises are

continued, children may not be well for a day or two: these exercises should, therefore, be practised gradually. The hands being delicate, also require to be habituated by degrees to the necessary exertion, or they become blistered. The first exercises induce perspiration, the appetite is increased, and the digestive functions more easily fulfilled.

Some children suffer no inconvenience from gymnastic exercises, others are sick, have palpitations, and vertigo; it is the province of the physician to say in what manner each individual should be treated under these circumstances; as a general rule, we can only repeat, that all fatigue must be most carefully avoided.

XXVIII.

On Voice, Speaking, and Singing.

Among the Grecians, gymnastics and music, were considered as the foundation of education. "Music," said Plato, "is comprised of every description of speech, whether in prose or verse, which may tend to form the mind;" and gymnastics comprise all the exercises that can serve to improve the body.

"It is surprising," said Plutarch, "how advantageous is singing, not only to health, but also to the maintenance of general strength, not of gladiators, but of the strength of the principal viscera of the body, whence depends the state of the health." What we have now to examine is the influence of voice, considered as a gymnastic exercise in speaking and singing. A few words on the organ of the voice are here necessary.

During infancy the organ of voice being in an imperfect state, and unable to support the efforts of exercise, we have purposely spoken of the gymnastics of the muscles of the body; we have now to treat of the gymastics of the larynx and lungs.

On Voice.

Numerous authors have vainly endeavoured to prove that the larynx resembled either a stringed or a wind instrument, but no instrument whatever can possibly give a correct representation of the organ of voice, which is composed of the lungs, bronchi, trachea, larynx, cartilage, ligaments, cords, nerves, epiglotis, palate, nostrils, teeth, tongue, and lips. Merely to study this organ in the larynx, without reference to the other organs enumerated, would be studying only one part of the subject.

But we cannot here enter into the anatomical study of the different parts of this organ of the voice. In the Grecian gymnasia, there were professors called *phonasci*, appointed expressly to see that the voice was duly exercised in the open air, near the sea side; and in rooms where the walls influenced the sounds, recitation, declamation, and singing were also taught. Tertullian designated these professors, tamers of the voice; their custom was to raise the voice by degrees, slowly and regularly, and then to lower it in the same way. According to Aristotle they were compelled to practice every morning, and great attention was given to their mode of living.

In Rome, the declamatory and vocal art had reached to a high degree of perfection; actors took the greatest care of their voice, and, to

avoid fatigue, remained in bed late in the morning. Suetonius relates, that Nero wore a plate of lead on his chest when he spoke in public, in order to give more strength to his voice. This practice was also common among the Grecians, but the strength of the voice greatly depends on that of the lungs and thorax, and still more on the organization of the larynx.

A few observations will serve to prove how erroneous was the opinion of Nero and of the ancients:—A celebrated French tragedian, whose voice was fine, and greatly admired by the public, said, "that notwithstanding the breadth of his chest, the facility and strength of his voice, that if he merely wore a simple belt across his chest, his voice was neither so clear nor so powerful. Every body is aware, that singers avoid tight cravats, and female singers carefully guard against tight lacing.

In modern nations men, who have been occupied with physical education, have not sufficiently felt how much the proper exercise of the voice might influence the thoracic development of the chest, and the state of the general health. Yet, in Prussia, singing is considered as an indispensable element of the education given to all poor children; it is placed on the same level as writing and arithmetic; at Philadelphia, in the institution founded by the benevolence of Mr. Girard, the banker, vocal exercises are invariably taught.

The larynx and chest, are put in motion by voluntary and involuntary muscles; by means of some of these muscles, it is easy to regulate their movements, which may at once increase the width of the chest, and give strength to the muscles and ligaments of the larynx. It has frequently been found, that a voice, which appeared weak and harmless, has acquired a happy development by means of graduated exercise. The pulpit, the senate, the bar, the stage, furnish striking examples of this fact. It was to the exercise of the voice, that our celebrated fellow-countryman, Baron Cuvier, attributed his exemption from consumption; at the time of his professorship, it was feared he would have suffered from this fatal malady; his lungs were strengthened by the beneficial exercise of lecturing, his general health improved, and he had no longer cause to fear any pulmonary complaint. "I knew," says Vandermonde, "a very delicate child, threatened with consumption, who appeared to be on the verge of the grave, and whose natural constitution was changed by the gradual exercise of vocal music; the instruction was conveyed as an amusement, no excess of application was required, and the suffering child was gradually restored to health.

One of the first French tragedians had been, from infancy, subject to occasional coughing, which created serious fears for his health. He

was strongly advised by his friends to give up the stage, and follow some other pursuit; but his taste for theatricals was of so decided a nature, that it was not possible to induce him to alter his determination to appear before the public. But, guided by the advice of Talma, he took care to avoid fatigue, and gradually accustomed his delicate vocal powers to long and impassioned sentences, and to the fullness of voice necessary to be heard in the different parts of a large theatre. Under the influence of such prudent and well-directed study, his duties acquired no small degree of precision, his voice was strengthened, became proof against fatigue, and his health was completely re-established.

Reading aloud, recitation, and singing, when managed with due regard to the natural powers of children, are as useful and important in their physical education as gymnastics of the muscles. Not only the larynx, the trachea, the lungs and chest, are exercised, but also the diaphragm, the abdominal muscles, communicating to the stomach and bowels a useful stimulation. Singers, or public orators alone, know how fatiguing are vocal exercises; what perspiration, bodily exhaustion, and hunger, are felt after a long sermon, or speech in the senate, or repeated singing. Teachers, who exert themselves for the benefit of their pupils, experience an unusual degree of fatigue, and want of food, after giving a lesson; yet speaking or singing may be con-

sidered as beneficial to the health of growing girls or boys as walking; and those who are long confined in the same apartment, find a sort of compensation in exercising their lungs. Solitary confinement, which has been so much lauded by some short-sighted philanthropists, weighs with greater severity on women than men, because female occupations exercise the body less than those of men; and the statistical reports prove, that more women have succumbed to low fever since the establishment of silence in penitentiaries than before.

What are we to think of those teachers and governesses who enforce strict silence during any lengthened period, and prevent, at the same time, their pupils from taking exercise?

The education of the organ of voice requires, therefore, a higher degree of attention than that usually granted; not only is it essential that children should have a clear and pleasing voice, but that their chests should be expanded, and that they should know how to regulate their respiration. It is in infancy that children should be taught to read aloud, and have a clear enunciation; every syllable should be distinctly pronounced, and the breath not taken too frequently. Intelligent and precocious children often evince a predisposition to stuttering; they must then be made to speak slowly and distinctly. If it be desirable to commence teaching children to

speak and read early, it is not the same with singing. After seven or eight, it is full time for them to begin to learn a few scales, taking care only to exercise what the Italians term *voce di petto.* In all cases fatigue must be avoided, and these vocal exercises must be rather a recreation than a study.

There are few individuals who are not at some period of life, required to read aloud. What is most difficult in this exercise, and in recitations, what most requires teaching, is the art of properly taking breath. Punctuation serves not only to divide sentences, but also to regulate respiration, We may, to a certain degree, recognize the extent of inspiration and expiration of a writer, by the punctuation of his sentences. To read is to adapt momentarily our respiration to that of the writer; there must be a kind of harmony between the reader and author, or else reading may be compared to music played out of time.

"In all speaking," says Blair, "the management of the breath requires a good deal of care, so as not to be obliged to divide words from one another, which have so intimate a connexion, that they ought to be pronounced with the same breath, and without the least separation." Before reading an author well, we must become accustomed to his style.

Nothing is more unpleasant to the ear than bad reading; nothing indicates a worse educa-

tion than not reading distinctly, and without giving a proper degree of respiration according to the punctuation; every style has its time, its *andante*, and *forte* as in music. When a person reads without understanding, it is soon made evident, because he fails in all the rules of punctuation.

"The tone of the voice," says Londe, "may shew how far a person can enter into the sentiments and feelings of the author." To this observation of Londe may be added, that judgment may be formed of the capacity of the reader, by his enunciation, the inflexion of his voice, his manner of taking breath, and the termination of his sentences.

Blair says, "that if a man reads with pain to himself, he is sure to give pain to his auditors." Quintilian recommended his disciples to become gradually accustomed to long words, so as to read them without effort, or without taking breath in the midst of a sentence, or a period." According to some authors, "the art of taking breath, either in reading, recitation, or singing consists in making long inspirations, and to breathe so as the air may not be expelled from the lungs too forcibly."

It may be laid down as a principle, either for recitation or singing in general, that deep inspirations must be made, and that expiration must be moderated; but in this, the whole art of singing does not consist; lengthened respiration

is not of so much consequence as to take breath at the different parts indicated by the meaning of the sentences, and particular style of the work. The habit of deep inspirations must be acquired in childhood, as they dilate the lungs; it is, therefore, desirable to select for children, works adapted to call for these exercises.

We are not acquainted with any author who has given special attention to gymnastic of the lungs. The study of declamation and singing undoubtedly answers this purpose, but it is by chance that children are taught recitation and singing. It is very seldom that pieces are written which might serve both to expand the lungs as well as to be an additional accomplishment. Singing and recitation are considered in an intellectual rather than in a physical point of view.

"In the execution of a piece of music," says Bennati, "the inspiration must be always deep, and slow or quick, according to the character of the music, or the manner in which the sentences are separated. In all cases it is essential, for the perfection of the voice, to be guided by the length of the musical sentence, so as to take a sufficient quantity of breath, that the lungs may not be exhausted before the termination of the musical sentence, or that a pause occurs which admits of a fresh inspiration. There must always remain in the lungs a certain portion of air after the execution of each sentence; the last note will be always more precise, and the sound of

the voice more perfect; these principles are equally applicable to recitation—the speaker to keep up the voice during a long conversation, and the orator to deliver a speech with ease to himself, and to take breath without its being perceived, or without destroying the musical effect." The greatest musician of his time, the celebrated Pacchierotti, was so convinced of the importance of these principles, that he resumed the art of vocal music in this single rule:—*Respirate bene; mettete ben la voce, pronunciate chiaramente, ed it vostro canto sara perfetto*

In the art of singing there is a preliminary part of music termed *solmisation*, calculated to make clever scholars, by gradual exercises on time and intonation. The study of these exercises generally takes place in childhood, under the direction of masters who too frequently are strangers to the art of singing. Exercises are negligently taken up by children required to exert themselves beyond the limits prescribed by nature. The efforts made to pass these limits soon destroy the principle of the voice, and the ligaments of the throat. When this injury is done it is beyond remedy, and all the art in the world could not restore the softness of the primitive voice, which is for ever lost.

It must also be observed, that the generality of masters are not aware of the necessary precautions with regard to the first teaching the proper method of singing; when to take breath,

and not to breathe too often, or to fatigue the chest, by keeping the breath too great a length of time. After two or three years exercise, they make good theoretical musicians, but the natural voice is destroyed; the assistance of first-rate masters is then sought, but proves wholly useless.

To arrest the progress of the evil here mentioned, it will be advisable to pursue the following method. Reading music at first sight, and singing, are totally independent; it is, therefore, useless to unite the study of two things which are naturally separate. Why not teach children the notes, time, and all that relates to the theory of music before they begin singing? Then let them have a proper master to direct the exercise of their voice.

The strength and extent of the voice do not solely depend on the state of the organs, the fulness of the lungs, and the construction of the larynx; exercise has on these organs the same power as on the muscles of movement; the cartilage, ligaments, the muscles, and the vocal chords, gain strength, and the breath which escapes from the lungs through the larynx produces vibrations so much the stronger in proportion to the resistance of the organs. Exercise can alone enable the glottis to diminish or increase, and give to the larynx the power of rising or sinking. All notes are made in the larynx by

its ascent or descent, its dilatation or contraction.

It is not thus with speech; the articulation is not only formed by the action of the tongue, which draws the sounds together, but also by the palate, the mouth, and teeth, the lips and nostrils. "Good singers," says Fetis, "require more than a fine voice, although this gift of nature is a great advantage, that all the talent in the world cannot supply, but an individual, who knows how to pitch his voice, and to manage it well, derives greater benefit from it than an untutored singer, who has a fine voice.

Pitching the voice is uniting, as perfectly as possible; the movements of respiration, with the emission of sound, and to develop the voice as much as its compass will allow, but it must not degenerate into a shriek. In former times, when what is called the good old Italian school existed, pitching the voice was a long study; it was not then supposed that talent could be *improvisé*, it is easy to judge what pains were taken, by the following anecdote.

Porpora, one of the most illustrious Italian masters, took a liking to a young pupil, and asked him if he felt sufficient courage to follow his directions, however tiresome they might prove. Receiving an affirmative answer, he took a sheet of music paper, wrote down the diatonic and chromatic scales, the thirds, fourths, and fifths, the intervals, shakes, appogiaturas, slurs,

turns, cadenza, and sol-fa-ing of different sorts. Both master and scholar spent a year over this single sheet of music; the second, and third year they did the same; the pupil began to murmur; the master reminded him of his promise. The fourth year passed, and so did the fifth; no change had been made, the lesson continued the same, with some instructions on articulation, pronunciation, and declamation. At the end of the fifth year, the scholar not aware of the progress he had made, was surprised to hear his master say, "go my son, thou hast nothing more to learn, thou art the first singer in the world." He spoke truly, for this singer was Caffarelli.

Speech is the most powerful weapon of civilized nations. In woman, it is a melodious sound, reaching to the heart, and filling it with joy and sorrow.

Speech requires a great deal of exercise; the voice is weak in infancy, uncertain in youth, strong and energetic in manhood.

Declamatory exercises are useful; they cause the lungs and chest to expand, and they have been wisely prescribed for narrow-chested people.

The voice is powerfully modified by growth, exercise, and disease; when growth is arrested the voice is shrill; it is evident that the cartilages of the larynx offer but little resistance, and that its vibrations are uncertain and weak. As growth proceeds, and the human being ap-

proaches nearer to perfection, the voice is formed, and improves. "The sound," says Malgaine, "alters like an instrument made by the hand of a workman." When growth is completed, the larynx is formed, the expression of feature is determined, the voice also is formed, unless new changes brought on by age, modify it at a later period

There is less fear of change with female voices; but whenever growth is irregular or sudden, the voice is uncertain, and offers numerous modifications in sound, strength, and extent; and the care requisite to preserve the voice should commence early.

When owing to cold, or too great exertion in singing, the glottis is covered with mucosity and secretion, it loses its elasticity, and the voice becomes shrill; a foreign agent seems introduced; it may be said to vibrate on the vocal chords, and injures the clearness of the sounds, like a piece of paper placed on the strings of a guitar or a violin, which spoils the effect of the music.

Diseases of the chest injure the voice; palpitation of the heart causes tremulation; emotion may be feigned, but it owes all its charm to reality, and it is easy to distinguish real feeling from the effects of debility. Nevertheless, on the stage, the best actors and actresses, have acquired such a power of imitation, that

they can feign the deepest sorrow, and the greatest joy!

Some gymnasiarchs have united singing with exercises: we have already given our opinion on this subject. Those of our readers who frequent the theatres, may witness the fatigue and exhaustion resulting from declamation, when actors are obliged to speak or sing, during violent exercise. The best singers are seldom fine actors, and when superiority of voice is combined with high tragical powers, it is always to the detriment of health. The early death of Malibran, and other celebrated tragedians, could be brought forward to prove what we advance; in our opinion it is desirable to avoid violent exercise while singing. We admit that rhythm may regulate the movements of the body, but rhythm can be marked by an instrument. If it were required of dancers to sing, and execute the time and steps at the same time, they would be very soon exhausted.

To terminate this chapter without treating of defects of pronunciation, which treatment will be found in the education of the anormal state, we must observe, that if desirable results are to be sought for the development of the chest, in the exercise of speaking and singing, the selections that can best contribute to this end, should be carefully made.

For reading or declamation, select, gradual, and measured sentences are requisite; poetry

may be recited with advantage, if well chosen. The pause at the end of the line, or the rhyme which marks the strain or verse to be finished, is not alone required, and does not always mark the proper time to breathe. There is much difficulty both in reading and reciting verses. "To adjust and compound," says Blair, "the melody of verse, with the pauses of the sense, so as neither to hurt the ear, nor offend the understanding, is so very nice a matter, that it is no wonder we so seldom meet with good readers of poetry." For singing, slow time, musical sentences of a length adapted to the state of the pupils' lungs, in a word, gradual and selected vocal exercises, will be the most certain means to develop the chest, fortify the lungs and the larynx, and to give to children a fine voice, which is undoubtedly one of the most pleasing gifts of nature and education.

CHAP. XXIX.

Education of the Senses.

We by no means desire to renew discussions respecting innate or acquired ideas. The organs of the senses are instruments by whose assistance ideas are formed, and sensations are conveyed to the brain. An individual wanting one of the five senses, must necessarily be deprived of the ideas it gives rise to. Persons born blind cannot have any notion of colours. This fact being once established, and well understood, it necessarily follows, that the more any given organ is exercised, and properly developed, the more the corresponding sense will be enlarged, and the more extended will be the ideas. By development, we do not allude to extent, but to perfection. Hence the necessity of preserving the same method for the improvement of the senses as that adopted to strengthen the muscles, or organs of motion. There is a gymnastic for the senses as well as for the muscles; this gymnastic is peculiar to each sense, and its importance must not be lost sight of.

In infancy, general exercises ought to have the preference over exercises of the senses, though this is not usually the case; for education is established on a very different basis. The pyramid is began at the top instead of the basis;

the organs of the senses are first exercised, and are, of course, early expanded, to the great detriment of the whole organization, which is neglected, and left in repose, whilst the exaltation of the senses is so great, as to cause the most serious diseases. The object of education should be, not to increase the power of the senses to the detriment of health, but to prevent errors and bad habits

Sense of Feeling.

Feeling is the first sense exercised; on entering the world, the body receives impressions by coming in contact with the atmosphere, and the objects which surround it. This sense generally loses a great deal of its capacity for perception among individuals exposed to the intemperance of the seasons; while children bred in luxury always remain delicate, and comparatively sensitive. Who does not recollect the story of the Sybarite, disturbed by a rose leaf, fallen on his couch?

It is advisable that the body should be early habituated to come in contact with resisting objects. Hard beds, strong, though not rough clothing, strengthen the fibres; exquisite sensitiveness is attended with no advantage; the body is rendered liable to be in a continual state of agitation, and atmospheric variations of heat and cold act powerfully on delicate constitutions. If

it be advantageous to fortify the skin, and prevent its being affected by the action of the clothes with which it comes in contact, the fingers should be exempted from this rule; the greater their sensibility, the more it is developed the better; and the greater the sense of feeling, the greater the aptitude of the hand in cultivating the arts.

It requires more lightness and delicacy than may generally be supposed necessary to handle a pencil, or play on the piano forte. It is impossible to reach perfection in any art, unless full command be had over the hand. Sculptors judge of the beauty of a statue rather from touch than sight; and it may justly be said, that the sense of feeling is more acute and certain, and frequently rectifies the errors of the other senses.

The touch is the most certain sense, because it is the most material, and acts immediately on bodies. Sight, sound, smell, are volatile substances, and less attainable than more material objects on which the touch is exercised and applied without any intermediary; but this sense would be equally liable to error, if unassisted by the other senses. When any intermediate body is opposed between the senses and the object to be appreciated, the ideas transmitted are uncertain and erroneous. If the fingers are hardened by work, or any other cause, the touch is

unable to appreciate or judge, as it materially depends on the state of the skin on the hands and fingers.

Many examples are given of the delicacy of touch among those individuals who are unfortunately deprived of sight. It is asserted that a blind boy could distinguish some colours by the touch; he had remarked, for instance, that red absorbed the damp. Salzman, in his annals of education, relates that blind children have been taught to distinguish colours, and judge how many leaves a book contained; and even to read when the characters were strongly marked. Upon this principle, books for the blind are now manufactured. The exercise of the senses may be made at play; this was Rousseau's opinion, and is probably that of all enlightened governesses, who take an interest in their employment, and are aware of its importance.

Taste.

The sense of taste, and the sense of smelling, are intimately connected. Placed at a distance from the stomach, they seem to be sentinels guarding against danger; both give warning of the danger of an ingredient, by the disagreeable impression conveyed; thus the introduction of any nauseous or poisonous food into the stomach is prevented. It would be difficult to isolate the senses of taste and smelling; they almost

invariably act simultaneously, which is easily understood, as they are seated so near each other, and the functions they have to perform have so close a relation. The one without the other would be incomplete. In order to avoid the disgust of nauseous medicines, it is customary to prevent smelling by suspending respiration; thus the taste is weakened. Taste varies according age, constitution, habits, and disease. Taste is most useful to medical men, chemists, and *culinary artistes*.

Great attention should be paid to the normal state of the sense of taste; any anomaly in this organ, is indicative of an affection of the stomach, of the salivary glands, or the tongue itself. All perversion of taste is a symptom of this affection, and met with in young girls afflicted with divers maladies; such as rachitis, green sickness, gastritis, or chronic gastralgia, and other inflammations of the intestinal tube. Children are fond of sweet things, men of tonic substances; women have unaccountable and strange tastes, varying according to different circumstances.

The state of the tongue greatly influences taste; if dry or furred, the proper flavour of what is eaten cannot be ascertained. Long sleep, the abuse of spirituous liquors, and other narcotics, blunt the taste; while acids, spices, and tonics, sharpen it.

During growth, there is little to be done for the sense of taste; it only reaches perfection at

the adult age. Of all the senses, it is the least powerful, and the least cultivated in females.

Smell.

Rousseau was of opinion, that smelling should be considered as of one of the imaginative senses; and the ancients offered incense to their Gods, in the belief that they might be agreeably affected through this organ; yet nothing justifies either the opinion of Rousseau, or the ancients. This sense, far from being imaginative, is very positive, and, like taste, is essentially connected with the preservation of organism. Smell is, perhaps, more likely than taste, to give an idea of the quality of food, or of the objects with which we are connected. This sense, however, is less material than taste; the exhalations arising from different bodies give notice of what may be disagreeable or repulsive; the smoke and perfume of the ancient sacrifices, which rose to a considerable height, and disappeared among the clouds, probably gave rise to the supposition that incense was pleasing to the Gods.

When substances emit gas and vapour they affect the olfactory nerves. Perfumes are principally used in civilized nations. In the East, and among those people who have, through effeminacy, degenerated into slavery, they are much valued. It is commonly known that the smell of henbane cures intoxication. Perhaps the degraded inhabitants of the Eastern world require opium and henbane;

the intoxication produced by these narcotics, preventing reflection on their humiliating situation. The habit of using scent is extremely injurious to the nervous system. Young persons should, on no account, be permitted to acquire the habit of carrying smelling bottles.

Smell may, for a time, make up for the want of nourishing food. It is related that Democritus lived three days on the vapour of hot bread. Bacon also gives an instance of a man who lived three, four, and sometimes five days, without eating or drinking; he had a certain mixture of herbs, of which he smelt occasionally!

The effects of snuff, on reflective and literary men, are well known. When the sense of smelling is perverted, or its action destroyed, the cause is sometimes mechanical, sometimes the result of disease, either in the nose or brain; and if in physical education there is little to be said on the sense of smelling, it is nevertheless desirable to watch over the sense, as any defect in it may be the symptom of some disease. Persons who cannot smell, or distinctly pronounce the n's and m's, have generally a polypus, or some other affection in the nostrils.

Hearing.

Hearing may justly be considered a social sense. It can be carried to so great a degree of

perfection, when exercised with regard to music, that it has been observed, that a person who felt all the powers of harmony, might be said to have a sixth sense. By the intervention of hearing, man exchanges ideas with his fellow creatures; whereas, deafness gives an air of stupidity, even to the most enlightened individual. The sense of hearing is more generally cultivated than any of the other senses, owing to the study of languages and music. The most powerful and terrible passions are awakened by the accents of grief or enthusiasm; a few words have sometimes the power of influencing a whole assembly; the effect seems magical.

The sense of hearing has the most direct effect on the brain; hence its capability of the nicest cultivation; this applies not only to educated but to savage life. The native tribes of Indians have the ear particularly practised to the economy of their mode of life; they can distinguish the footfall of man or beast at an almost incredible distance, as well as all the varied sounds of beasts or birds; and to such a degree of sensibility is this organ capable of attaining, that there are musical professors who can distinguish the least discordance in an orchestre of three or four hundred instruments!

The ancients so fully appreciated the power of hearing, that they had recourse to music, in order to cure mental diseases. The effects produced on Saul, by the harmonious sounds of

David's harp, have been beautifully described, and are probably in the recollection of all our readers.

Great advantages might be derived from the power of music on our organization; melodious and soft music might modify the asperity of certain dispositions. Montaigne's father may indeed be said to have been well inspired, in desiring his infant son to be awoke by harmonious sounds.

In well directed education, a judicious selection of music should be made; it is most essential to accustom the ear to time. We cannot too often repeat that nothing is indifferent in education. A want of ear often depends on an inequality of the development of the organ of hearing; there are numerous causes giving rise to affections of the ear; they require particular attention.

Persons who cultivate music are greatly enervated by this study; a state of irritability is also developed to a very great degree with nervous persons. We are acquainted with a painter, who was always violently affected when he played on the violincello, an instrument in which he took great delight. Mention is made, in London, of a celebrated musician, who prevents epileptic attacks, by the influence of music.

Deafness is one of the most distressing infirmities that affect mankind, and the causes in

which it originates are most numerous. Growing girls are very subject to deafness, but it is merely temporary. When deafness is caused by scrofula, the whole constitution must be modified; it would be useless merely to direct attention to the ear alone; the sense of hearing being the most useful for intellectual and social development, it necessarily should call for a proper degree of cultivation.

Sight.

Sight is a voluntary sense. It is possible to prevent external impressions from having any action on sight, as it is also possible, by exercise, to increase its power. With what precision, and admirable delicacy, painters discern the smallest shades of colour in painting! With what facility, the hunter, the sailor, and the general of an army, judge of distances, and recognize different objects afar off!

Sight is the sense nearest the soul, and it is probably the reason why it is called its looking glass. How eloquently are sensations expressed in the eyes! The sense of sight seems only to be bounded by the horizon; it conveys a knowledge of height and length, distance, and the number of bodies. This sense is equally applicable to large and small objects; the eye measures the extent of a planet, and analyzes the insect and the mite!

Among astronomers and naturalists this organ is susceptible of the most marvellous perfection; when this sense is unpractised, nothing appears distinct, while on the contrary the minutest details are observable.

Sight should be carefully attended to during childhood; the eye easily acquires vicious habits, its exercise is often unvoluntary, and depends on the position taken with regard to light. If in early infancy the cradle is not so placed, that the light may come on one side, and cause the child to look obliquely, its eyes are straight; in the contrary case, a child is almost sure to squint. Various causes have been given for squinting, but one of the most frequent is undoubtedly from the inequality of the muscles of the eye; this inequality is forced when the infant is badly placed, and compelled to make efforts to see from whence the light comes.

It is not only in the cradle, and during early infancy, that this state is manifest, and easily developed, but it is equally so at a later period; the manner in which girls are seated at their writing and drawing lessons, may give rise to the unequal power of the muscles of the eye. It would be well to imitate painters, who seek the north light, and admit it from above.

Squinting often proceeds from imitation, and it is dangerous to place children with governesses or nursery maids, who have this defect, as

children by mockery, or attempt at imitation, easily acquire this habit.

Squinting arising from the unequal action of the muscles, or from imitation, is easily remedied; we some time since cured a lady, of seven and twenty, who had been known with this defect from infancy, and it made so material a difference in her countenance, that her own parents scarcely recognized her.

When squinting proceeds from unequal muscular power, the general rule must be followed, to place and maintain the eyes in their natural position, exercise the weak muscles, and keep the strong ones in repose; this end may be attained by different means, either by employing mechanics to prevent the eye moving in a wrong direction, or in placing it so as it may be retained by will.

The less sight is exercised, the less it is extended; spectacles keep it stationary, but do not strengthen it, and they should not be used without absolute necessity.

Addison says, "our sight is the most perfect, and most delightful of all our senses; it fills the mind with a variety of ideas, converses with its objects at the greatest distance, and continues the longest in action without being tired or satiated with its proper enjoyments."

CHAP. XXX.

On External Applications, Baths, Cosmetics, Stays, and Dress.

According to Epictetus, cleanliness is to the body as purity of sentiment is to the soul. The importance of the action of light on living bodies, with regard to the development of shape and colour, as well as the action of caloric on the growth of individuals, and the influence of the air on repose or motion, continually carrying off from living bodies the perspiring fluids, will undoubtedly have been appreciated; it now remains for us to examine the action of divers agents, when brought in contact with the surface of the body.

The skin has numerous sympathies, which are a source of disease, on account of the frequent excitation to which it is liable; our attention to it is therefore not only necessary, on the score of *beauty*, but on account of health, which is far more essential, as illness and beauty are incompatible.

The functions of absorption and secretion, continually filled by the skin, could not be interrupted, without creating disorder in the whole economy. All external impressions resound internally, either on the lungs or the chest, as all internal impressions, particularly those that take

place in the intestinal viscera, have also their action on the skin. A correct idea may be formed of absorbent functions, by the remedies applied to the surface of the skin, reaching the torrent of circulation.

Bichat has demonstrated, by various experiments, that gas was absorbed by the skin; this property of absorption may account for that of deleterious vapours.

The skin has a constant secretion of vapour, and retains particles of perspiration. They cannot remain on the surface of the body without causing irritation; hence the necessity of a frequent renewal of clean linen and the use of baths.

The air certainly carries off much of the perspiring matter left on the skin; yet any indissolvable particles adhere to it until removed by baths or frictions. Most animals bathe. "It is," says Bichat, "a law imposed on all perspiring creatures; in the lower classes of society, labourers and work people are subject to innumerable cutaneous diseases, which have long called forth the sagacity and discernment of many practitioners, and these maladies may be ascribed to want of cleanliness."

A frequent renewal of linen clears the skin from the secreted substances arising from perspiration; and baths would be of considerable use to the poor who are unable to change their clothes often; but, under all circumstances, they

are advisable, not only as conducive to cleanliness, but also to the improvement of the skin.

Plain water is the only *cosmetic* we recommend to young ladies, either before or after puberty. Warm bathing must not be too frequently resorted to, unless by the advice of a medical man, as it may occasion general debility of the tissues. Water whitens the *epidermis;* when it is too long in contact with the skin, the ends of the fingers are shrivelled, but when the water is evaporated they return to their natural state. If the face be rubbed with soap and water, it wears out the epidermis, and having over excited the sanguine capillary vessels, renders it rough, and often covered with pimples.

A lady of my acquaintance, was so much in the habit of rubbing her face, that her cheeks, nose, and forehead, when she went in the open air, became so red, that she had all the appearance of a drunkard.

After bathing, friction and shampooing may be of great benefit to young persons, whose skin is affected with atony, and unable to perform its functions; cold baths may also be prescribed, in cases where too great sensibility engenders nervous affections. Baths must not be taken immediately after meals, during digestion, and cold bathing should never be resorted to for persons in a state of perspiration.

Warm baths are generally enervating; if too hot, the pulse beats quickly, respiration is acce-

lerated, the veins are swelled, violent head aches, palpitations of the heart, vertigo and fainting ensue, and sometimes apoplexy takes place.

When the functions of the skin are well understood, and the numerous maladies liable to occur if these functions be not regular, more attention will be paid to the temperature. To go from a warm to a cold room may be compared to going out in winter merely with summer garments, and thus running the risk of being affected with those disorders of the chest originating in suppressed perspiration.

Dress alone can establish a proper equilibrium between the functions of the skin and the different temperatures; and this reason suffices to refute the bold assertion, that the same clothing is equally well adapted to all seasons and climates.

During growth, and the establishment of puberty, diseases of the skin are very frequent; it is in early life that eruptive fevers are so fraught with danger, and sometimes destroy all beauty; yet when these maladies are caused by sudden growth, they must not be checked, but allowed to take their course. Under all circumstances, however, it is advisable to call for the assistance of an enlightened practitioner, as we cannot sufficiently enforce on the minds of parents, that during the period of growth, diseases of all kinds may take root in the economy.

Numerous *Cosmetics* have been extolled for their virtues in beautifying the skin, while the substances, of which they are composed, are most likely to injure it. Red and white minerals attack the epiderm, and destroy it, and being sometimes absorbed by the capillary vessels give rise to serious illness. To cosmetics may also be ascribed divers cutaneous diseases, which are local, and do not in any way depend on the general state of the constitution, nor of the intestinal viscera.

Vegetable rouge, composed of carthame and saffron is not dangerous; but what colour can be compared to the natural complexion of youth and health? *Lait virginal*, composed of aromatic plants, should not find admittance to a lady's dressing table; for how is it possible to distinguish it from that mixture, compounded of white vinegar, white lead, and common salt,—a composition not only irritating but dangerous.

Genuine *Eau de Cologne*, and *pâte d'amande*, are the only cosmetics young ladies should use; rouge may be suitable for actresses, but not for modest females in private life. Water is by far the best *cosmetic*—the most valuable *tonic*; used by the ancients at their sacrifices, at the libations and feasts still existing in the Eastern world; it moderates the excessive warmth of hot climates.

Hair, like the nails, seems to be an elongation of the epiderm; every hair is a species of capil-

lary tube, containing a sort of coloured substance, rendering it either light, brown, dark, or red. The passions have the strongest influence on the hair; a few hours sometimes suffice to turn it grey. Oil and pomatum protect the hair from the damp, and keep it in curl; but as soon as the damp penetrates, as may be observed on very wet days, the desired purpose is no longer answered.

The greatest caution is necessary in the employment of the renowned powders and cosmetics for improving and beautifying the hair; the various dyes are also dangerous, and their use attended with fatal accidents, of which the following example is a proof.

A young lady, eighteen years of age, of lively disposition, good constitution, and in the full enjoyment of health, was advised to employ the powder of Iris to dye her hair, which was very long and thick; she complained of head ache, without, however, giving it much attention, or being in the least aware of its cause.

One summer's evening, in the country, and in a state of perspiration, from violent exercise, Miss E—— put some of the Iris powder on her hair, and then went to bed, but was prevented sleeping from head ache, and was more than usually irritable. The next day she went out on horseback, though in opposition to her mother's wishes, but she was soon compelled to return, being seized with a nervous attack,

followed by convulsions; and delirious fever came on; the face was red, eyes fiery, skin burning; bleeding, and cold baths were prescribed: the following morning she was a maniac.

Vegetable diet, cold bathing, and other means were resorted to: the cephalalgia gradually decreased, sleep returned, and two months afterwards, delirium, convulsions, melancholy, irritability, and occasional fits of unmeaning laughter seldom occurred. At the end of the third month, all these symptoms had disappeared, the young lady was thin and weak, she was allowed more nourishment, recovered her strength, and wisely resolved never more to employ the powder of Iris.

The practice of wearing stays is as common as the use of cosmetics; it is a subject upon which so much has been said and written, that we might dispense with making any further remarks; but as we differ from the general opinion respecting it, we shall take leave to observe, that we by no means consider that stays give rise to the fatal results so often attributed to their use. Are they in fact, the direct or indirect cause of consumption, deformations, palpitations of the heart, and all other diseases incident to females? That tight lacing is injurious to health, admits of no doubt, but where one woman destroys her constitution by tight lacing, hundreds improve their figure and beauty by wearing stays.

We have already said, that stays should not

be worn during gymnastic exercises; their object being to give full development to the muscular power, the body must be quite at liberty. To those individuals requiring support, we should undoubtedly recommend stays. But what sort of stays? In a country where the beauty of the shape was not left to chance, this part of the toilette, now either considered with disdain, or prejudice, would be thought by philosophers worthy of consideration. Was not great praise given to the inventor of a new bridle? And is any part of dress, by which our mothers, wives, and daughters, are to benefit, of less consequence than the garniture of a horse? But it has become habit to inveigh against stays, and women are to be Venusses without care or trouble of any kind. Beauty is but relative, it must have culture, and not be left to nature alone. Art and grace are as necessary to the modern Venus, as to the Venus of Cythera.

Young girls inclined to be stout, require stays, to prevent their becoming unwieldly; those who are weak, want support; but in both cases, evil instead of good will result, if the stays are badly constructed, so as to interfere with the digestion, circulation, and the full dilatation of the chest.

When the least fear is to be apprehended from tight-lacing, short stays should be worn: a small waist is erroneously supposed to be beautiful, and as the stomach offers little resistance,

it is often too much confined. By wearing short stays, there is infinitely less danger, as the whole body cannot be tightened.

We shall not give a description of corsets, though we by no means think the subject unworthy of notice, but merely observe, that French stays having few bones, seem to unite the greatest advantages. All stays, however, that do not prevent *free breathing, circulation, digestion, or easy movement*, will meet with our approbation, and we recommend the use of them to ladies noted for their elegance, as well as those remarkable for the negligence of their persons.

The greatest attention should be paid to the manner in which the front of the stays is cut out; cancers of the breast too often originate from pressure; the gussets must therefore be properly shaped, and adapted to the figure. Duffin condemns all stays, and recommends ladies in high life, using their influence upon society, to produce an improvement in a custom he deprecated—so important did he consider the subject.

It is not only pressure of the breast which should be avoided, but also that of the neck, arms, and legs; it is not unusual to find varicose veins caused by tight garters, and cold and swollen feet, originating in the absence of circulation. Another common defect with

ladies, is to wear tight shoes; and as it is impossible to diminish the natural size of the feet, the only results are corns, chilblains, and other troublesome affections. Damp must ever be carefully avoided, and although Locke advised that young people should follow the Scotch custom of walking bare-footed, we think it impracticable, dangerous, and unbecoming, in our social state.

Dress, according to the present fashion, is much less injurious to health than when the waists were worn short, and the many secret appendages used to conceal deformities, are geneally free from danger; but what is most to be feared are low dresses, exposure to cold, and the variations of the temperature, in a climate so damp and changeable as that of England. It is leaving a ball room, or any heated apartment, to go into the open air without a sufficient degree of covering to guard against the effects of damp and cold, that we condemn; and it is certainly to the habit of wearing low dresses, and short sleeves, that may be attributed the origin of many diseases of the chest, which terminate fatally.

CHAP. XXXI.

On Mixed and Passive Exercises.

THE term mixed exercise is principally applied to riding, which the ancients very justly considered as the exercise most conducive to health, and the development of strength, as it combines all those performed in the gymnasia; the greatest advantages can be derived from it, when advised as medical means; but in the gymnastic of the normal state, riding should be considered as comprising all gymnastics.

"Health, and cheerfulness," says an ancient author, "are more easily acquired by exercise on horseback than by any other manner." The variety of movements, the pleasure of riding with ease and facility, certainly afford more enjoyment than other occupations, while the mind is interested, and the body exercised. Whether trotting, cantering, or galloping, nearly all the muscles are in motion. To go on horseback, hold the bridle, maintain the equilibrium, encourage the horse, there is not a single muscle that is not put in action alternately. "Riding," says Dr. Londe, "communicates to the organs the strength necessary, suitably to fulfil the functions confided to them, regulates all the acts of life, without accelerating them too much."

Exercise on horseback cannot be considered as mixed, unless the riders go very slowly; but if they either trot or gallop, the exercise is active.

Young ladies who ride, should most carefully study the manner of sitting on horseback; they should be seated in the centre of the saddle, and not hanging by the near crutch. They should be able to preserve the balance, sit upright; it is not uncommon to see girls, who have been improperly taught, contract deviations of the vertebral column, through the bad position contracted while riding; and where there is the least predisposition to those diseases, the exercise must not be too much prolonged.

Driving, or exercise in a carriage, may be considered as good exercise; it is both useful and agreeable, and strongly to be recommended, if there be any cause which prevents children walking. If they spend several days confined to the house, they require to breathe fresh air, and being in an open carriage, enables them to do so with ease and comfort; and nothing gives to the economy such a stimulus as the contact of atmospheric air. Travelling by land has often the best possible effect on the health of children. In well-directed education, why not make travels one of the necessary elements of physical and intellectual development?

How many new ideas may not a child acquire by travelling, without excess of mental exertion!

How many things observed by those who travel, may be learned, the description of which is never found in books! Daily experience proves that children return from a journey with an increase of physical and intellectual strength developed unknown to themselves, and certainly without any excess of mental fatigue. Such are the exercises calculated for children, and which may be turned to the greatest possible advantage in the physical education of the anormal state.

"In crossing rivers, lakes, mountains, and deep ravines," says Dr. Johnson, "we experienced all imaginable transitions, thermometrical, hygrometrical, and barometrical, without a day's or an hour's sickness! We returned to modern Babylon, more like gypsies than London citizens —We were embrowned in complexion—improved in health, and impressed with a conviction of the beneficial influence of *travelling exercise in the open air.*"

Repose.

In the human body there are organs which are in continual motion; their functions only cease when life is extinct. The heart and lungs are constantly in action, whether man be sleeping or waking, and the will has no power over them.

The organs, which may be termed voluntary, are subjected to a species of gymnastic, and may be increased by exercise; but the organs ne-

cessary to the preservation of life are not merely relative, and do not follow the laws of gymnastic. The heart and lungs, through more than usual activity, are worn and weakened, but seldom increase in size; and as exercise does not make them grow, repose cannot make them diminish, for these organs have no rest.

But for the relative organs of life, for the brain, the senses, and the muscles, repose is not only useful, but absolutely necessary. The attention long fixed on the same subject, fatigues the brain, and change is essential to its repose. It is the same with the senses; the eyes cannot be continually fixed on the same object; the ear cannot bear the same sound, the palate receive the same impressions without fatigue, and loss of all stimulus.

After fatigue, repose becomes necessary; during this repose, the nutritive particles, and the humours of the body, in action during motion, are fixed, and form part of the animal.

The heart and lungs are doubly active during exercise; the nutritive liquids circulating in all the vessels, may be considered in a state of suspension; but during repose, the most material particles may be said to precipitate, and then the phenomenon of adhesive nutrition takes place.

Exercise in youth gives strength and activity to the muscles; but prolonged exercise, without a suitable degree of rest adapted to the age and constitution of the individual, weakens them;

they may justly be compared to packthread. When this is the case, girls are tall and thin, and exercise is prejudicial.

The learned Bacon said, "that it was essentially necessary, for the preservation of health, to make up for the waste occasioned; but when exercise is not judiciously employed, it is impossible to repair the exhaustion it causes. Repose only can relieve fatigue, and rest after exercise can alone make it really healthy.

Nature unwilling to leave repose at man's discretion, has compelled him to find relief from fatigue in sleep; and as any spring continually stretched is easily snapped, so men's organs, which are all elasticity, must be relieved, in order that their elasticity may be more lasting. With children of rapid and sudden growth, rest calls for special attention. With children of slow growth, exercise and rest must be suited to their age; a child of seven or eight years old, must not be subjected either to the same degree of study, the same recreation, or the same repose, as a girl of fifteen or sixteen. And when rapid growth gives rise to fear any spinal deformity, parents and governesses must carefully adapt employment to the child's degree of strength, and repose to the degree of weakness, or the state of the constitution. Aware of the importance of these observations, we disapprove of the plan adopted in public schools of making all

children submit to the same restrictions without regard to age or constitution.

But while anxious to shew that repose is necessary after fatigue, it does not follow that rest is more beneficial than exercise, because it is during rest that nutrition is effected. Too much rest is prejudicial as well as too much exercise; in the latter case, girls are thin, the muscles lengthened, the bones without strength. Too great a degree of rest lessens the circulation, which does not extend through the extremities; and those persons who spend the greater part of their lives lying on a sofa, have generally cold hands and cold feet, and continual palpitation of the heart, owing to excess of blood; at other times the muscles of the back and the spine are wasted, or the fluids remain in the joints; the whole body is swelled, and gives an appearance of health, which is deceptive; the plumpness is graceless, and there is no harmony in the economy. These swellings of the joints are observed in young as well as in grown persons; life seems to require excitation, and they are victims of a weakness which, through want of exercise, becomes incurable.

A proper medium of exercise and rest is essentially important. Gymnastic without rest is injurious; the one must counterbalance the other. Prolonged rest makes all the functions languid, even those of the brain are affected; in immo-

derate exercise, all the functions are imperfect, because there is weariness. Of all the exercises of the organs, the exercise of the intellectual faculties is the most fatiguing and necessitates a great degree of repose. The senses and the brain require rest long before the muscles: this fact may account for the habit of a celebrated warrior of ancient times, who, to keep himself awake, held over a metal bason a golden ball, which fell from his hands when he went to sleep.

Young ladies having much intellectual occupation, require a proportionate degree of rest; but education would be quite misunderstood, were repose supposed to mean entire rest for the body and the muscles. Sleep is full repose, but there is partial, and varied rest. Thus the brain is at rest in gymnastic exercises, and the muscles are not in action during intellectual employment. Well directed physical education, therefore, requires occupation and repose to be combined, and relief afforded after exertion; establishing, by these means, an equilibrium between the organs and the functions of the economy, and preventing fatigue extending beyond the limits prescribed by nature. Weak and sickly children require a greater degree of rest; and the day ended, it would be desirable for placid sleep to terminate a series of well-managed exercises.

Recreation may be termed repose, and serves to counter-balance the effects of mental labour

When a child leaves off play, avoids the noise and merry games of its companions, to seek rest and solitude, mothers and governesses should direct their attention to this unusual conduct; it is either a moral or physical symptom; sometimes the youthful mind prematurely indulges in wild and romantic thoughts, which cast a shade of melancholy on all that surrounds it; at other times, the want of rest and solitude corresponds with a sensation of general fatigue and langour. Young girls appear almost a burthen to themselves, they cannot bear the least noise, they seem scarcely able to support their own delicate frame; and not aware of the phenomena about to take place, instinct seems to lead them to prepare for their novel life. Considering these signs either as moral symptoms, or symptoms of corporal weakness, or of approaching puberty, unceasing watchfulness is indispensable.

Sleep.

Sleep has been improperly represented as the image of death, which is by no means the case, as during sleep the heart does not cease to beat, the lungs to expand, or the nutritive and secretive functions to perform their action. But during sleep the feeling of existence is lost;

breathing is slower, pulsation languid, and digestion is prolonged, which explains the proverb, *qui dort dine.*

If the organs of will and intelligence require more repose, they also demand a greater portion of sleep. Sight is the first sense overpowered by sleep; the eyelids fall involuntarily, the muscles cease their contractions, and the body has the greatest tendency to bend with the joints; it is difficult to walk; a sleepy person can scarcely keep straight, and when sleep comes on, the body is subject to the laws of gravity, and would fall, unless supported, and placed in a suitable condition for sleep.

The position of the body during sleep, is worthy of attention, both from mothers and governesses; slight lateral deviations may then easily be cured. The perfect *decubitus* is disapproved of, yet this horizontal position is generally suited to growing deviations. Children must lie either on the right or left side, according to the inclination of the spine, and to the hour at which they took their last repast before retiring to rest. Lying on the right side, digestion is easier, and the heart beats more freely. Many persons constantly sleep on the right side all night, but unless there be some cause for so doing, it is certainly a bad plan invariably to keep one position.

By sleeping on the right side, if the heart

beats more freely, the lungs on the right side are always pressed, and cannot breathe, and the respiration only taking place on one side, it follows that the lungs on the left side have greater action. This explanation proves why young people, who die of consumption, have the lungs on the left side more affected, and why chronic diseases of the left lungs are generally so fatal.

Well constituted children, where there is no deviation to be feared, should be accustomed to sleep alternately on the right and left side, so that one of the lungs may rest while the other acts, and that the respiration may be equally shared.

When the heart beats too quickly, young people should be made to lie on their backs, which proves that it is a ridiculous custom, followed in certain schools, that of going round, the bed rooms, and waking all the children lying on their backs, without knowing whether the position be good or bad, or suited to the various constitutions.

Sleep must be adapted to age, sex, constitution, and mode of life. Infants sleep a great deal; they may be said to vegetate; they eat and sleep. As they grow up they sleep less, and pay attention to what passes; they begin to live less for themselves, and more for society. Friedlander, in his

work on Education, had regulated the hours of repose according to the different ages, thus:—

Ages.	Hours of Sleep.	Hours of Exercise.	Hours of Study.	Hours of Repose.
7 yrs.	fr. 9 to 10	10	1	4
8	9	9	2	4
9	9	8	3	4
10	8 to 9	8	4	4
11	8	7	5	4
12	8	6	6	4
13	8	5	7	4
14	7	5	8	4
15	7	4	9	4

Dr. Simon proposed forming three divisions out of these numerous categories, and established them in the following manner:—from seven years to ten, from ten to fourteen, from fourteen to eighteen. Besides which, he proposed mixing exercise and repose, so that scholars may employ their recreation as they please, and according to their own feelings. These divisions may suit boys whose growth is more regular, and who are not subjected to so great a change as girls; but for the latter, neither the regulations of Friedlander, nor those of Dr. Simon appear founded on a knowledge of the laws and phenomena of growth.

Till twelve years of age the two sexes are nearly similar, as to their different functions;

nature is busy in forwarding the development of the individual; but later on, there is a striking difference, which generally takes place from twelve to sixteen. In warm climates this change is sometimes effected before the age of twelve, in cold climates frequently after sixteen; but it depends on the country, and on the moral and physical constitution.

A knowledge of the laws of organization will lead to a division of employment, rest, and sleep, suited to the phenomenon of growth.

Thus, from seven to twelve years of age, nine hours' sleep, ten hours' exercise, recreation, and rest; and from two to five hours' serious occupation.

From twelve to sixteen, eight hours' sleep, ten hours' exercise, walking, or rest, and six hours' study, are adapted to this period of life.

But where there is any want of strength, or growth is too sudden and rapid, a judicious mother, or enlightened governess, ceases to have any regard for division of time, and judges what degree of exercise or rest may be useful.

It may be observed, that deviations first take place when children are prematurely compelled to study, or that they are not managed by persons of discernment, and are kept occupied for too great a length of time. The children of the poor acquire deformities in their earliest years; sometimes when teething, or from want of whole-

some food, and healthy habitation; but the children of the opulent, from seven to fifteen, that is during the time of their studies, which must be prevented, by a wise and judicious distribution of time.

One of the greatest errors in education is, to subject children to whole days of intellectual employment, by no means adapted to their health or strength, and the love of change natural to youth. Six hours properly occupied, under the direction of a clever governess, suffice to improve the most brilliant talents. It is not the time given to study, but the manner of employing it, that promotes a good education. An affectionate mother, who brings up her own children, or a conscientious governess, feeling her responsibility, will know how to make exercise and recreation beneficial to her young charge. Every conversation conveys either moral or intellectual instruction; even good principles are easily instilled, when they have the weight of good example; youth must be guided by the heart as well as by the mind.

As girls increase in strength, their studies may be gradually prolonged; there is a time when constant occupation is mostessential to happiness; industry is the best preservative of innocence. Nine hours employment, including the cultivation of drawing, dancing, music, and allowing some interval for relaxation, seven hours sleep, andeight hours for more serious occupations and exercise, would

be a proper distribution of time for grown-up young ladies. Idleness, late rising, engender melancholy; romantic notions are the rocks to be avoided; they are fatal to purity of mind and manners. Diana, when a huntress, was chaste; pensive and indolent, she became enamoured of Endymion.

Sleep should be calm and deep; exercise alone can render it so. After an idle day, a sleepless night generally ensues; how many useless thoughts may then intrude on an active mind and sensitive heart.

A wholesome bed, and well aired apartment, are essentially important, and it is advisable for children to sleep alone, but on no account with elderly people; it may be greatly to the advantage of the latter, but decidedly injurious to youth. There are instances in the Bible, of the health of young women being sacrificed to old age, of which the advice given to king David is an example.

Millin de La Courvault relates, that a poor girl, of fifteen, slept in the same bed with her mother, and the side turned towards her was attacked with an ædematous humour, and lost nearly all feeling. Mr. Chomel, of the *Faculty of Medicine*, in *Paris*, visited this patient, and ordered a separate bed, and by other appropriate remedies, cured the patient; but two years afterwards, again sleeping with her mother, she fell ill. The same author relates an edict of the parliament

of Bordeaux, against an old woman who paid young girls to sleep with her, and they gradually wasted away, and died.

Without endeavouring to discover how this phenomenon of loss of health on one side, and a recovery on the other, takes place, it is certain that whichever side is turned towards an old person is first affected.

Dreams, according to a philosophical writer, are but the inheritance of the illusions of the day; they are a continuation of forcible impressions affecting the heart or brain; they are the luminations of the mind, or the emotion of the heart, outliving the drowsiness of the senses;—without farther seeking to interpret dreams, or draw an horoscope, if considered as a prolongation of violent sensations and eager thoughts, they may powerfully assist in making known the true state of the youthful mind. Socrates and Sylla could not dream alike, neither could dream like the vulgar.

The nightmare is the evil genius of sleep; it is a species of oppression, accompanied by anxiety, fright, and the impossibility of moving or pronouncing a word, until suddenly awaking, liberty is restored, and the cruel illusion disappears. This often occurs to young persons whose imaginations are ardent, subjected to hypocondria, or hysterical fits; among those, in short, who have an excess of sensibility. The nightmare sometimes denotes an affection of

the heart or lungs, or a bad position taken during sleep, or an overloaded stomach. From whatever cause this may be, when this evil genius is a frequent visitor, attention should be given to the person suffering from his assiduity.

Somnambulism is common to many young people, and is evinced by screams and muscular movements; this may be said to constitute a malady, and depends on an over excitation of the nervous system. Sleep is not then restorative; proper exercise, during the day, is the best remedy for these illusions.

The somnambulist is greatly influenced by magnetism, and we feel it our duty to guard parents againt a practice which may injure their children by over exciting the nervous sensibility.

CHAP. XXXII.

Excreta.

Locke has devoted several pages of his work on Education, to show the necessity, and possibility, of regulating the wants of nature; he was of opinion, that good health depended greatly on the attention given to the accomplishment of these functions; and as this subject is so intimately connected with health, we feel bound to recommend all parents to bear in mind, that disorder in the excretive functions may be attended with the most serious results.

In early infancy the derangement of the digestive functions is of the highest importance; prolonged constipation often brings on convulsions; if the bowels are loose, children are liable to contract all sorts of disease. At about two years old, the secretive functions may be regulated. Locke advises, that children may be habituated to satisfy these natural wants immediately after breakfast. It appears to us preferable, that they should do so after rising in the morning; and having gone through the necessary ablutions, washing the face, hands, and mouth, is favourable to the accomplishment of this function.

It is, however, much more difficult to regulate these functions, if meals are not taken at stated hours; and Locke was certainly guilty of con-

tradiction, in advising irregularity in the repasts, and regularity in the excretive functions; but we quite agree with this philosopher, in considering it unwise to have too frequent recourse to medicine, to obtain freedom of the bowels.

It appears to us more easy to obtain these results by a change of food, and giving that which is more or less easy of digestion, according to the state of the case

Restraint may sometimes be necessary, but it should never be too much prolonged. In the pages of history it will be found, that Tycho Brae, driving out with the Emperor of Austria, and not daring to have the carriage stopped, in order that he might satisfy his natural wants, died from the effects of this restraint.

Some persons perspire a great deal; however unpleasant it may be to them, this perspiration must not be suppressed, as the suppression might be dangerous, and attended with serious diseases.

When females reach the age of puberty, they are subject to a natural discharge; this secretion, of a peculiar nature, becomes the regulator of health, and as it is one of the most striking phenomena in the life of woman, it requires particular attention, and we shall treat of it in a separate chapter.

CHAP. XXXIII.

Womanhood.

NEARLY all authors who have written on Physical Education, having arrived at this most important period of female life, appear to have thought, they could give no other account of it, than by entering into every minute detail of the anatomical functional organs then called into action. Such a course would have been entirely misplaced; our object is to be useful to mothers and governesses, for whose guidance this work is expressly written; and in alluding to the mysteries of Diana and Lucina, we shall endeavour to guard against any expression inconsistent with the strictest delicacy. That "Growth governs life," is a proposition to which we are anxious to draw particular attention, as a truth continually exemplified. In infancy teething, in childhood all the phenomena of life, are subjected to the regularity or irregularity of growth. The time preceding puberty, growth is essentially important; but when this desirable change has taken place, the organization is but slightly susceptible of modification; or, at least, the action of external or internal agents are less powerful; and the individual having acquired additional strength, offers a greater degree of resistance.

The time of life to which we allude, is in every respect fraught with deep interest; there is much to be feared, and much to be desired; this delicate period has its dangers: there is uncertainty in the organs, variation in strength, tendency to illness. The constitution either improves or deteriorates; these struggles lead children to womanhood; they must be overcome, as a preparation to the relative duties of social life, and the fulfilment of the great destinies of nature.

During first and second childhood, the organs seem to acquire strength and size, but are yet so imperfect, that they are merely sketched; at a later period, nature produces an over-abundance of nutritive fluids, which are drawn towards the organs that most require them. The exterior parts of the body then increase, and the whole frame acquires additional strength.

In females there is great power of formation and creation; it is in the destiny of woman to preserve the sacred deposit of the human race; and her full development is accomplished earlier than that of man.

Although the full growth of the bones may take place a considerable time after puberty, this change of life, may, nevertheless, be considered as the completion of the edifice; for, notwithstanding the delay in ossification, both man and woman are perfect in their formation as soon as they cease to live for themselves alone, and that

nature indicates they may thenceforward be the origin of a new family.

"What can be the cause," says Madame Boivin, "of this sudden change, this species of new life, this unusual activity, occurring at a certain age?"

It would be giving proof of very little observation, to seek a hidden cause, for the complete development of woman. Once born, she has a destiny to fulfil.

But as in the laws of nature, nothing is sudden, and development is gradual, in childhood growth is slow; but when life is secured, and has sufficient strength to bear up against assailing agents, nature arouses the organs, which hitherto have remained in a species of repose.

The precise time at which puberty takes place has often been discussed, but has ever been studied separately, not in connection with the phenomena of growth. Puberty may be considered as the completion of growth; it is the full bloom of the human plant; its vivid colours either shine or fade, according to the richness of the stem, and its proportion of healthy and nourishing sap. When growth is regular, and its phases follow in due succession, without accident or interruption; when the internal organs increase, fill all their functions easily; when the brain is formed, and the chest and lungs are expanded or contracted in an anormal manner; when the diges-

nose, coughing, cutaneous eruptions, redness in the face, want of activity in the cerebral and digestive functions; sometimes epileptic and hysteterical fits. The throat is often sore; the forehead is burning, heavy and painful; pains in the eyes, and the eyelids are surrounded by a dark semicircle; the pulse is unequal, the mammary glands are swollen, and prevent the free motion of the arms; the whole system is affected. This state of discomfort may last several months, sometimes years, and its influence on the mind is immense.

It has always been observed, that when there are obstacles to the regular establishment of puberty, young girls are in a state of continual anxiety and discomfort, and seem to be a prey to grief, without being able to assign any determinate cause for their sorrow: overwhelmed by timidity, the sligtest noise alarms them; tears flow in abundance, all happiness seems to have fled, and death is ardently desired. When it happens that two young ladies, with similar feelings, are left together, they form plans to destroy life, which is so great a burthen to them, and mere chance has sometimes prevented a fatal termination. But this state of things cannot be of long duration; and as soon as the sufferer is no longer influenced by physical pain, and that the mental powers are victorious, then suddenly every thing is viewed in a different light; all is bright; peace and content are restored;

a feeling of universal benevolence fills the young heart, a friend only is wanting; this friend is eagerly sought: how fortunate is it when the choice falls on a mother, who is thus enabled to strengthen and guide her own daughter!

Overwhelmed with so many different sensations; affectionate and susceptible at the same time; miserable without cause; happy without enjoyment: strange combination of contrast and exaggeration! the young girl dares not examine her own state of mind, cannot command her attention, and anxiously seeks solitude. Such is the moral state of those who suffer from a disordered physical organization, which should meet with the serious attention of physicians, mothers, and governesses; that the sufferers may find all the enlightened and affectionate care necessary to the restoration of their health.

From twelve to eighteen is generally the time at which this tribute is paid to nature; the climate, the state of the constitution, early development, manner of living, are so many different causes that have direct influence on the establishment of puberty. When, at length, the will of nature is fulfilled—that the painful period of this metamorphosis is effected, all the disagreeable sensations disappear, as if by magic; girls seem to have shaken off their chains, and gradually improve in beauty; their cheeks and lips are fresh and rosy; the eyes are bright; the voice

melodious, the accent soft and feeling; and beauty has reached its climax!

But does woman, the depository of all these charms, possess them without knowing their power—like Pandora's box, from whence so many evils were spread over the world? At this time of life, how numerous are the wants and inclinations to which a female is subjected! She stands alone, and seeks a being on whom she can lavish all her tenderness, and pour out all those treasures of love and affection which fill her own heart! With what a series of struggles has woman then to contend! She must repress her rising passion,—conquer her most natural inclinations,—sacrifice them to reason, honour, and virtue!

O troppo
Imperfetta natura
Che repugna alla legge!
O troppo dura legge.
Che la natura offende.—

says she, when love and modesty are at variance—when indifference conceals the heavings of her heart,—when she must appear cool and collected, while her inmost soul is overwhelmed by sorrow and despair!

Nature has completed her work; the young girl, full of health and beauty, may become a mother! But new obstacles arise; the laws

and calculations of society must be respected, and often cast a shade over youthful happiness; hearts must not beat, eyes must not see, sensitive and feeling beings must not love; yet they must live in a world where the very air that is breathed kindles the imagination and awakens the senses!

Thus, after escaping the numerous perils that await puberty, new dangers are to be overcome, and the trials of the imagination and the head, are so cruel, that human beings, unable to resist their influence, too often droop, and gradually waste away victims of social institutions or ambitious parents!

Enlightened and affectionate mothers should guard against prematurely developing their daughters' sensibility; they should not too soon be launched into society; agreeable recreations, exercises suited to their age, useful occupations, may be judiciously employed to counteract the effects of the nervous system, which brings on puberty early, renders it more dangerous, and may cause its effects to have a fatal influence on the whole existence.

This physical phenomena having once taken place, cannot be arrested without danger and injury to the health. "This phenomena," says Roussel, "is a characteristic function necessary to the sex; to which, all the other functions, seem in abeyance; it is the foundation of health and beauty; where it is not regular, the vital

movements are impaired, the mind and body are alike injured."

It must never be forgotten that, at this time of life, the nervous system is liable to be affected; and whatever tends to create nervous excitation, should be carefully avoided. One of the most common diseases arising at this period, is consumption, or tuberculous phtisis. Two thirds of the juvenile inhabitants of large towns are carried off by this malady; the green sickness is also common, and is always followed by derangement of the internal organs of the chest and heart.

Although the limits of this work would not admit of our entering farther into the numerous diseases with which this period of life is threatened; yet, having deeply studied all the disorders to which young girls are subjected, and given our special attention to their physical development, we have naturally been led to extend the original plan of the first edition of this work, and have treated separately of the physical education of the anormal state in the following book.

BOOK THE THIRD.

CHAP. I.

Considerations on the Physical Education of the Anormal State.

> I, that am rudely stamp'd——
> I, that am curtail'd of this fair proportion;
> Cheated of feature by dissembling nature;
> Deform'd, unfinish'd, sent before my time
> Into this breathing world, scarce half made up;
> And that so lamely and unfashionable,
> That dogs bark at me as I halt by them.
>
> SHAKESPEARE.

No, Rousseau! all is not perfect that comes from the hands of nature! all does not degenerate in the hands of man, who neither loves deformities nor monsters! We are not only born weak, we want not strength alone; for notwithstanding the greatest possible care, the best organized laws, we are not always brought into this world in a healthy state. At Sparta, where

every thing was done to promote the beauty and vigour of the human species, still there were deformities; and notwithstanding the laws of Lycurgus, all was not perfect that came from the hands of nature.

It is the general opinion of most philosophers, that when man is born, the series of evils that assail him through life commence, and that these evils result from our social state; but they may be traced to a far more remote source; they take rise with our organization; "and the annals of science," says Billiard, "serve to testify that the infant has contracted in its mother's womb affections of which the fatal results are too evident at its birth." Daily facts confirm this proposition. Children may come into the world healthy, diseased, convalescent, or perfectly cured of an ancient malady, which proposition is directly contrary to Rousseau's opinion. Give, therefore, to Rousseau healthy children, free from defect, with a fine vigorous constitution; for Rousseau will not educate weak and sickly children. But give to us those children that the laws of Lycurgus would have condemned to the apothetes, and that the philosopher of Geneva looked on with contempt, and thought unworthy of his precepts.

If children are sometimes born with the seeds of diseases, which, far from being arrested at birth, continue to follow their divers stages, how

important is it not, for parents and children, that science should observe the external signs of these congenital predisposition to diseases, so as to suspend, if possible, their progress! If children bring into the world an evil conformation, how far superior is art, that seeks to bring these defects of nature to the human type, to that savage philosophy which sacrifies human beings, because it seems too difficult to cure their defects!

When children are born healthy, physical education is simple and regular. The causes that produce diseases in adults must be avoided, as these causes act more powerfully and promptly in early age than at a later period of life. Children must have the genial warmth of the sun, pure air, wholesome nourishment, and good exercise; the human plant will then be developed in its full rectitude and beauty. But if the child be born diseased; if it have suffered either in the womb, or in its passage into the world, it must not be hoped that nature unassisted by art, will bring the suffering child to a normal state. If art and science be not called to its aid, the child will perish, or carry through life, the burden of a deformed and painful organization. We mean not to speak of the obstacles that may prevent the vitality of the newly-born babe; this sketch is rapidly drawn in our chapter on Infancy. We have here to treat of the constitutional or acquired state with which children may, for

some time, drag on a painful existence, but when thus afflicted seldom reach beyond adult age.

The aberrations of nature are numerous, both in the animal and vegetable kingdom. Among these aberrations, a great number of those relating to the shape of the individual are not opposed to the establishment of life, and to its greater or less prolongation; yet there is no deformity that is not prejudicial to the action of some organ or its functions, and that is not through life, a cause of physical or moral suffering, sometimes of premature death.

There are predispositions, or constitutional weaknesses, not noticed at birth; it would, for instance, be difficult to say, whether a newly-born child was predisposed to nervousness, scrofula, rachitism, or consumption. Numerous deviations in the normal state are only manifested in the course of some years; this observation is mostly applicable to the osseous system, the deformities of which are not always evident at birth. As children grow up, and the organs are called into action, their healthy or morbid state becomes apparent; and if the morbid state be neglected, it becomes grafted on the constitution, and injures it. The nervous state is manifested in infancy by convulsions; in adult age, by madness. Scrofula, which delays growth; rachitism, which deforms the solid parts; and tubercular rachitism, or consumption; such are the constitutional defects, which do not prevent

children from living during a certain time, but prevent their reaching to an advanced age, and render them objects of continual suffering.

Thus, predisposition to nervous or cerebral diseases, to scrofula, rachitism, and tubercles, are the four chief maladies, the principle of which we bring into the world at our birth, and they claim special physical education, at an earlier period, than deviations in the normal state which may be considered acquired.

The plan we have laid down is by no means easy, but we are not to make a romance of physical education; we have not chosen our Emile; we do not cast deformed children into the apothetes; we do not refuse them our care because they are suffering. Let those parents, into whose hands this work may fall, be persuaded that it is far more difficult to treat this subject so that it may be useful to every mother, than it would be were it intended only for medical men; but let it be read attentively, for these pages shew the actual state of science on subjects which must deeply interest all those who have children.

If nervous, scrofulous, or tuberculous predispositions may be acquired, they may also be prevented. But what is scarcely in the power of art to cure, is the morbid state of the whole organization when struck with death. Look to science for advice and assistance before it is too

late; but do not ask for miracles! Do not suppose, that art can furnish, at command, the phosphate wanting in the bones of scrofulous individuals, when the whole constitution is debilitated, and life endangered. Do not ask of science to restore a tuberculous, suppurating, or gangrenous lung, as if by magic; for science cannot reach the pectoral cavity, to cauterize the wounds, and separate the gangrenous from the healthy part. Ask of man, things that are in his domain, and not those that are in the power of the Deity alone! but if parents be gifted with reason, let them not wait till the disease has reached its apogée ere they call for the assistance of art.

When parents are subject either to madness or epilepsy, or when there is scrofulous predisposition, and that there have been several victims to consumption in the same family, let the children be guided by a clever medical man, not by a pedagogue. "The most important and practical inference that can be induced," says Dr. Brown, "from the knowledge of the hereditary propensity of certain diseases, *is* that the descendants of those who labour under any hereditary disease should be shielded as far as possible from its exciting causes; for the predisposition is of various degrees; in some so intense, that at a certain period, the disease occurs by the spontaneous act of the constitution; but in others so

slight, that the co-operation of numerous agents is required to render it manifest.

Hence, the descendants of the gouty should observe the most rigid temperance; certain climates should, if possible, be selected till a certain period of life, for those of the consumptive. The offspring of the maniacal should be guarded, as much as possible, from mental irritation, and from all habits of life calculated to call their inherent tendency into action; whilst a meritorious and invigorating regimen and warmth should be appropriated to those who there is reason to think have derived the scrofulous diathesis from their ancestors. Another practical inference should be the propriety of avoiding matrimonial alliances between kindred families, as few are free from some congenital weakness or susceptibility.

CHAP. II.

Cerebral and Nervous Constitutions.

THE ancients termed diathesis that aptitude or facility with which some persons contract disease; diathesis may, therefore, be considered as synonymous with organic predisposition. Predisposition to certain diseases cannot be denied; they are not the same in all individuals. In children, born of parents nervous and irritable, or subject to any cerebral affection, excitation instead of acting on the whole economy, is concentrated towards the brain, and manifested in infancy by convulsions, chorea, epilepsy, and idiotcy, and in adult age by hysteria, hypochondria, or madness.

"During childhood," says Bichat, "all that relates to sensibility is forcibly marked; the nervous system compared to the muscular system is proportionately more considerable than in the succeeding years. It was undoubtedly this consideration which induced Alphonse Leroy, Hoffman, Sthalh, and other learned men, to suppose that the seat of all acute diseases was to be found in the brain. Without exclusively sharing the opinion of these authors, we cannot fail to observe, that there exists in childhood a great disposition to cerebral diseases. At this period of life, the evolutions, and organic diseases, are generally reverberated towards the centre of

sensibility, of which the trouble and emotion are soon manifested.

Who has not seen convulsions during dentition, during rapid growth, or owing to any moral commotion, or serious visceral disorder? Most authors have not failed to signalize the influence of the whole organization on the brain. It would be easy to show on the other side, the influence of the brain on the whole economy. Where the nerves do not reach, life is arrested during the fœtal state. A paralyzed limb, or a limb deprived of cerebral stimulus, is diseased and withered.

We do not write for the faculty, and we must, as much as possible, avoid entering into scientific questions: to us they would be of the highest possible interest, but our readers might not be prepared for them. It is difficult, however, nay, we may say impossible, that this work should be entirely free from what is medical, when we have to treat of deviations from the regular laws of life, which are so immediately in the province of medicine.

We find in the study of the anormal state, the division we originally established between the two species of constitution, which resume all individual varieties; and we shall soon find that the diseases of childhood are grouped round these two primitive elements—nervous matter, and sanguine fluid; and as all these cerebral affections have a common symptom, made evident by the disorder of the sensibility, or the

movements at which the nervous system presides, we shall see that all the affections depending on the alteration of the sanguine element—principle of all growth, will present a character common in the alteration of the sanguine fluid, and its products.

In the midst of this disorder of growth and organization, we still find a certain degree of order. Thus, convulsions, chorea, epilepsy, idiotcy, and madness, are found in individuals endowed with a nervous constitution, according as the nervous state may have been more or less excited or deranged; in diseases principally dependent on the fluids of the human body, we shall also find a sort of order in the midst of disorder. Thus scrofula, rachitis, tubercles, are only developed at certain periods. To prevent convulsions, would often prevent the diseases that succeed to them; to prevent scrofula, would often be to prevent consumption.

When the constitution is healthy, and the individual placed in favourable conditions, he will be developed almost alone, and with little care: in the contrary case, all will go wrong, and from bad to worse. In no circumstances is it more important to arrest the evil in its early stage, for convulsions and scrofula are the forerunners of a short and miserable life.

Let us now, in the interest of physical education, see in what manner we are to consider convulsions, chorea, and epilepsy, so common in childhood.

Convulsions.

By convulsions are understood the involuntary contraction of the muscles, of part or of the whole of the body. These contractions are intermittent or continued; they are more generally irregular and in paroxysms than lasting. Convulsions in children are usually manifested by partial contractions of the muscles, jaws, and eyes, or limbs. Convulsions are often but a symptom, but always a serious symptom, shewing the primitive or secondary irritation of the brain. If we judge of the danger of convulsions by the bills of mortality in London, and if any confidence is to be placed in these bills, it will be seen that convulsions are, after consumption, the disease that pays the largest tribute to death. Among predispositions to convulsions may first be placed the state of the natural constitution, whether or not the parents are subjected to cerebral diseases, or whether the child has undergone any commotion in its mother's womb or at its birth.

This predisposition is not more extraordinary than predisposition to gout or pulmonary phthisis; convulsions in infancy are the first phenomena, announcing the fatal inheritance brought into the world. If once these convulsions take root in the economy, and if, according to Hippocrates, nothing is done to change the constitution, premature death will ensue, or the child will be

always subject to these fearful attacks, or to chorea, or to epilepsy, and finally to idiotcy or madness.

It is, therefore, of the highest importance early to learn whether children are subject to convulsions, as they are the commencement of a series of affections, developed during life, when life itself is not extinct in the midst of the disorders of the organization.

Children in whom the fontanella closes slowly, and who are naturally lively and irritable, are much disposed to convulsions. Those whose digestive organs are delicate, or who have unwholesome or insufficient food, or who take irritating medicine, or who are subject to worms or flatulency, are equally subject to these muscular disorders; it is to be remarked, that overloaded stomachs, indigestion, or constipation, may have the same result. It has often been observed, that nurses who drink much fermented liquor, or take strong medicine, or have violent fits of passion, give convulsions to the children they nurse. There are infants so predisposed that dentition suffices to bring on convulsions; but if the salivation and slight diarrhea which then takes place are not arrested, the convulsions are free from danger: great noise, or very bright light, may give a commotion to the brain and induce convulsions, as may have been seen in the life of Gasper Hauser. Strong alcoholic liquors may produce the same effects. Weaning,

when not prudently managed, change of situation and habits, damp and cold, are so many causes of convulsions. In hospitals or schools, where a number of children are assembled, convulsions proceed from imitation.

To enumerate the causes which may produce convulsions besides hereditary dispositions, is to indicate what is to be avoided in physical education. As to hereditary convulsions, which cannot always be prevented,—to know this morbid predisposition is to be in guard against this disease; it is to have a powerful motive for adopting a special physical education to the state of the child.

Rousseau said that man alone was subject to imbecility because he returned to his primitive state. It is not because man returns to his primitive state that he is imbecile, but because this primitive state is allowed to exist without any endeavour being made to change the constitution. If man be born imbecile there would be but little hope of perfecting him, for imbeciles can only be educated to a certain degree. When children are born with a predisposition to imbecility, it cannot surely be said with Rousseau, that all is perfect coming from the hands of nature. It would be an error to leave children of this description to themselves, without seeking to give them an education suited to their mental capacity.

However this may be, convulsions during in-

fancy are the first step leading to chorea, epilepsy, imbecility, or idiotcy; and parents cannot be too careful in improving the state of their offspring.

"There are symptoms," says Beaumes, "which generally precede convulsions; the child who is threatened with them sleeps but little, starts in his sleep, awakes suddenly, screams, changes colour, whether awake or asleep; is drowsy in the day-time, and during this drowsiness opens or shuts his hand, moves about his fingers, and draws up his arms or legs convulsively,—then stretches out his limbs; he sighs and his respiration is unequal; he twinkles his eyes frequently; sometimes they are but half shut and turned, at times greatly agitated; the child sucks greedily, but at short intervals; the mouth is hot; he sleeps uneasily, and smiles when sleeping. This sleep is often the commencement of convulsions, but they are not perceptible as the eyes are shut; but by raising the eyelids the eyes will be found convulsed, as with epileptics. Children who begin to feel convulsed open their eyes, which are brilliant and fixed, the pupil is dilated, and the convulsions are decided if the hands be shut and cannot be opened without difficulty. When the child is about to have a fit, he leaves the breast, throws his head back, and appears to wish to swallow; the nose is drawn, and the physiognomy is contracted; there is a blue tint under the eyes and round the mouth. Many of these

symptoms, termed *inward fits*, are rather dangerous; they often indicate the state of inflammation of the membranes of the brain.

There is, however, no cause for alarm when children smile in their sleep during dentition, particularly when the bowels are open, and the child is in good health. But little judgment can be formed by the pulse of a child having convulsions; but the heat of the body, and particularly of the head, is a certain symptom. We do not here describe violent fits of convulsions; our desire is to make parents acquainted with the symptoms.

What is to be done when these symptoms occur? If possible it is always advisable to have recourse to a clever physician, and one mostly used to the treatment of infantine diseases; but for children with a predisposition to cerebral affections, some of these symptoms occur so often, and are so fugitive, that it would be requisite for every child thus afflicted to have a separate medical attendant. It is, therefore, to be desired that every parent should follow the advice of Hippocrates, and change the constitution of children, by giving them an education tending to render the habit robust, and to harden it against the ordinary causes of cerebral diseases. We repeat, that it is not to the treatment of convulsions that we devote our attention, but to the means of changing and improving the constitution. In enumerating the causes which favour this pe-

culiar disposition, we have partly shewn what was to be avoided in the physical education of children. The most efficacious means of improving their natural constitution is to procure for them a healthy nurse. Let the eloquent pages of Rousseau on maternal nursing be lauded, but let him not be taken as a guide in the physical education of children born with morbid predispositions. Let a young and blooming peasant, of sanguine temperament, of mild disposition, and good morals, give the breast to a child the offspring of a parent who is nervous, irritable, hysterical, or is affected with any cerebral disease; this is one of the earliest precautions to be taken, in order to change the constitution.

Instead of bringing infants up in hot-houses, for such we may term the nurseries of the great, let them be sent to the country, there to inhale fresh air, not to be fatigued by noise, or the blind caresses of over-fond parents.

It is well that children from their earliest age should be accustomed to bathing, and be gradually used to cold water; they should have no covering on their head day or night. Let the head be cool, the feet warm, and the body frequently rubbed with the hand, a brush, or flannel. Give them good plain food; carefully watch the change of natural nourishment, or mother's milk, to that of general aliments; dentition and weaning are two of the most dangerous periods of early life. According to the maxim

that sudden changes are dangerous, in all habits given to children proceed gradually; for instance, they must first be washed in warm water, and when they acquire a certain degree of strength, it may be daily used less warm, and finally cold. A celebrated physician has strongly recommended first washing with warm water and immediately after with cold.

Gradations are also required for food; before children are weaned they should be accustomed to light nourishment. Parents are generally too anxious to hear their children talk; this anxiety is natural, but unreasonable and dangerous. In vain do we recommend mothers not to develop their children's brains prematurely; they reply that they have not yet taught their children to read; but they do not tell you that they overload their memory with words, with sentences, with poetry: it seems almost impossible to obtain a little liberty for children:—what difference does it make if the brain be overworked, whether or not it be through the medium of books, or under the direction of a governess or a mother? Why call so incessantly and at so early an age on the intellectual powers, when the brain—sanctuary of all faculties, is so fragile a temple. Leave children to their amusements; do not constantly claim their attention: if the brain be too active it should repose, and the cerebral activity be counterbalanced by that of the muscles. If the child be subject to convulsions, and reaches to that state

of disorder which seems at every instant to threaten his weak organization, strengthen the muscles and limbs; let them have more precision, more regularity. Let all exercises be an amusement, but let these amusements be of a nature to induce a love of order. Give the child a gymnastic suited to his age and strength, and to the particular state of his health; in a word, develop his body, not his mind; give activity to the muscles.

We cannot too strongly enforce on the minds of those who have children, to avoid severe and lengthened punishments. How often are convulsions brought on by screams and sobs! It may be very easy to say children must be subdued, and not allowed to have their own way; we admit the fact, and parents and teachers should take care always to save appearances, and to uphold their own authority; but between the alternative of giving way to a child and throwing it into convulsions, we think that no one should hesitate; and it requires but a little judgment to find the means of concession without its being evident to the child.

Children should never wear tight clothes. Under no circumstances should the customs of the Spartans, who had the same clothing for summer and winter, be followed in this country, where the climate is so uncertain, at times so severe: let children be warmly clad, but not too much wrapped up, and deprived of the beneficial

action of the air. Locke recommended putting the feet in cold water; no advice could be more injudicious; cold at the extremities suffices to bring on convulsions: the feet should be kept warm, the head cool.

In early infancy the greatest attention should be paid to the state of the bowels: prolonged diarrhea weakens the child and induces convulsions; constipation has the same effect. These two extremes must be avoided.

Children are strongly inclined to imitation, nothing is therefore so dangerous as bad example; they must not be witnesses to scenes of anger or violent passions of any kind, not only on account of the moral evil, but because they might be tempted to imitation.

When a child is threatened with convulsions, and there is reason to fear an attack before the arrival of the medical attendant, there is no danger in giving a warm bath, provided the head be kept cool. Dr. Trousseau, of Paris, lately related an extraordinary case of convulsions, a violent attack of which was cured by compressing one of the carotid arteries. This method is also free from danger, if it be known where to apply the compression.

Convulsions affect children from the time of their birth to the period of second dentition. This disorder of the economy is irregular; at seven the convulsions appear in a more severe form, and have the name of chorea.

But during the first years of life, the organization being constantly in progress and not settled, diseases, and particularly convulsions, may have an irregularity of character, which must necessarily create a doubt as to the real seat of the malady.

If a child has once suffered from couvulsions they are very liable to occur again, and when they have taken place during the first seven years, without the constitution being improved, chorea, epilepsy, idiotcy, may come on after this period; and hysteria, hypochondria, and even madness, are some of the fatal consequences to the adult age. So that it may truly be said, that when nothing is done in early age to improve children's morbid constitutions, they are condemned through this negligence to undergo a series of maladies, commencing with convulsions, and ending in idiotcy or madness, if not in premature death.

Chorea.

CHOREA has nearly the same causes, the same symptoms, and requires the same remedies as convulsions; it is common to children who have been affected with convulsions, but is not generally manifest till between the age of seven and fourteen. Hereditary weakness during second dentition, the morbid state of the intestines, constipation, worms, and above all *fright;* moral

influence, and cerebral excitation arising from excess of study, are so many causes of chorea. This disease has also its forerunners; children threatened with a fit are dull, timid, alarmed without cause, the muscles of the face are drawn, the colour changes suddenly. The first attacks of chorea resemble convulsions, but mostly muscular contractions are rather partial than general.

In Sicily it is said, that the bite of a spider, called tarantule, gave rise to a muscular disorder very similar to chorea. In Scotland there is a fever called the leaping ague, and during the attacks, the patient is agitated as in St. Vitus' dance. But these two affections, the existence of which is contested by some authors, are uncommon, while chorea is very often met with. Chorea sometimes partakes of the characters of the diseases which succeed or precede it. Thus, the nearer children approach to second dentition, the more chorea resembles convulsions; at a later period it resembles hysteria.

The same means that have been recommended for the prevention of convulsions must be employed for chorea. The most clever practitioners of modern times, advise cold bathing, and cold water poured on the head. When chorea resists medicinal means, and there is cause to fear a relapse, change of air, pleasing occupations, mineral waters, sea bathing, frictions on the skin, have the best possible effect. Mr. Baudelocque recommends sulphureous baths, and the

numerous good effects he and other medical men have obtained, and that we ourselves have found to result from this medication, fully justifies the recommendation here given to parents, and medical practitioners.

Epilepsy.

This disease principally attacks children who have suffered from convulsions during first dentition. "Chorea, and symptomatic attacks of convulsions, when neglected, or improperly treated," says Dr. Copeland, "occasionally terminate in confirmed epilepsy."

Epilepsy has also forerunning symptoms, which much resemble those of the two preceding states. The causes are the same, but convulsions, and chorea, being predispositions to epilepsy, the prevention of the two preceding affections guards against the latter. The epileptic is often warned of the approaching fit by some particular symptoms, called *aura;* sometimes the attack may be prevented, by establishing a ligature on the limb from whence the *aura* seems to depart.

The falls, resulting from epilepsy may be very dangerous, and persons liable to them should never be left alone. All exercises, requiring equilibrium, and riding on horseback, should be avoided; and it would not be prudent to permit every sort of gymnastic exercise to epileptic children. The recommendation to keep the

head cool and feet warm, may here be again renewed. We are not now treating this subject for the faculty, but for parents, and when we have nothing particular to recommend, we should confine ourselves to the generalities already given in the chapter on convulsions.

Idiotcy.

ROUSSEAU was of opinion that man was only imbecile because he returned to his primitive state. If so, all would not be well that came from the hands of nature, for imbecility is due to suppressed development, or a diseased state of the brain. The same causes that produce convulsions, chorea, and epilepsy, produce idiotcy. The three affections we have described, therefore, lead to the production of the latter infirmity.

In the most remote antiquity, Hippocrates signalized, as a cause of idiotcy, the fatal habit of what nurses termed shaping the child's head. Our friend, Dr. Foville, shewed the dangers resulting from compression of the brain, by wearing certain head-dresses and bandages still in use on the continent; and it is proved, that in mad-houses there have frequently been patients who were sufferers from this barbarous practice.

We cannot too strongly insist on the necessity of continually watching over children subject to convulsions; for, according to Esquirol, a single attack suffices to arrest the ulterior pro-

gress of the infantine intelligence. Idiotcy is innate, or accidental; in the first case, children neither grow well, nor take the breast easily; their eyes want expression, do not follow the light at the accustomed time, and generally squint; they do not walk till between four or five years old; they cannot speak, and only articulate imperfectly: most of these idiots are rachitic or scrofulous. In the second case, when the infirmity is owing to accidental causes, children may be born healthy, they grow well, their intelligence is developed, their minds are active, but this activity not corresponding with their physical strength, is speedily exhausted; their intelligence remains stationary, and the hopes they had given are not realized.

Of all the causes that may produce convulsions, epilepsy, and idiotcy, none are so powerful as fear; and yet are we brought up by fear! This feeling is developed in children from the earliest age, and in the course of their intellectual education, fiction and fables increase this passion: parents and governesses relate fairy tales; servants are permitted to talk of ghosts and goblins. There are few children who are not afraid of the dark, or who will go from one room to another without a light, and yet no sentiment is attended with such fatal consequences as fear.

"No passion," says Burke, "so effectually robs the mind of all its power of acting and reasoning." The effect of fear rather resembles

the shuddering that precedes fever; sudden cold, or perspiration covers the whole body; it seems that the blood rushes from the exterior to the interior; respiration is suppressed, or slower than usual; the palpitations of the heart are sometimes heard, the face becomes pale, the tongue is cold, the muscles tremble, the legs bend under the weight of the body. With such symptoms, is it surprising that children should have convulsions, or epileptic fits, when the blood rushes from all parts of the body towards the brain, or that fright should render them imbecile, or idiots?

Fear developed in children vilifies the mind in early age. There are no circumstances in life which may not prove subjects of fear to children. This sentiment only powerfully effects weak and nervous organizations.

Fright generally originates in the dread of danger; when the extent of this danger is not ascertained from experience, fear arises from the relation given. Children should be accustomed to go from one place to another in the dark; they should learn to swim, consequently not fear the water; and know how to distinguish dangerous animals from those that are harmless; the sight of a man in a passion, or epileptics in fits, should always be avoided before children, as well as all things that may make too powerful an impression on young minds. There are habits

in some countries which seem to favour the belief in ghosts; for instance, the Christmas pantomimes, as performed in England, are of a nature to perpetuate fear; for though children may laugh at the figures, more or less deformed, the actor who plays the part of being frightened, does not make less impression on the infantine mind.

Mad-houses are filled with individuals affected by fright; it must therefore be sedulously avoided in the physical education of children born with predominance of the cerebral system.

There are other causes of chorea and idiotcy, which we shall not enumerate. All parents must feel that it is incumbent on them so to watch over their children, that they may prevent their indulging in vicious habits, which weaken the constitution, and affect the mind.

It often happens, that after too rapid growth, or after certain diseases, children are subjected to different cerebral affections; paralysis, for instance, is not uncommon.

As to the education to be given to certain idiots, and those not born in the last stage of degradation, or in whom accidental idiotcy has not annulled all the mental powers,—it can only be comparative; and must be specially adapted to each individual. Education thus considered, under the head of Orthophreny, will be found the subject of a chapter in the fourth division of this treatise.

We shall not here speak of gouty, rheumatismal, herpetic, and cancerous affections, which may also powerfully modify the constitution; the diathesis we examine have a more distinct character, occur at a more tender age, and the only age adapted for physical education. However this may be, the cerebral constitution, or predisposition to nervous affections, being known early, parents must avoid all that may cause any physical or moral emotion on their children's brain. The body must be strengthened, the mind left in repose,—the nervous susceptibility being so much the more developed, that the muscular power is less so, and *vice versa:* it is principally to muscular exercises, to recreation, and to plain food that recourse must be had.

Allow not young girls to frequent the theatres, nor indulge in novel-reading, which only serve to exalt the imagination, and injure the judgment. Keep them from balls, and societies, where they may be over excited; above all, give them the example of a simple and peaceable life,—an example of the most beneficial influence to delicate girls unable to bear the violent emotions arising in mixed societies.

A study we most particularly recommend, as conducive to bodily health and mental improvement, is botany; it necessitates gentle exercise, and cultivates simple and pure taste. The gymnastic exercises, given in the second part of this work, cannot fail to be of the most essential

service; a judicious choice is however requisite for children subject to epileptic fits.

We cannot conclude this chapter without adverting to the power of the *will* in the cure of some affections. Hysteria, for instance, so common at the period of womanhood, may be mastered by the *will*. If these attacks are often renewed, they may terminate in madness or paralysis. Young girls should not be allowed to see persons in hysterical fits, as such attacks are catching, and we have no hesitation in saying that no governess or servant liable to them, ought to have the care of children.

CHAP. III.

Sanguine Constitution. Scrofulous Diathesis.

We have pointed out two principal elements, as the foundation of all the varieties of constitutions. In the preceding chapter we have shewn which are the affections that may arise from predominance of the morbid state of the nervous system; it now remains for us to remark on some of those which may originate in the impoverishment of the blood—the necessary and indispensable element of all growth.

The primitive alteration of all circulatory fluids, blood, and lymph, is to be traced to the human seed; and hereditary scrofulous and tuberculous diseases, which constitute part of the individual, are also there to be found. It is the blood which contains the different principles which are successively developed and organized; it is in the sanguine particle that the different tissues of the economy in the normal and anormal state should be sought. A French physician designated blood as running flesh, and the saying was much lauded; would it not have been better to say, that blood was composed of flesh, bones, cellular tissues, nerves, scrofulous and tuberculous matter; as in fact, blood contains this mixture of good and evil, of organization and pseudo-organ-

ization? We are either born healthy, with an admirable equilibrium of the primitive element, nervous and sanguine; or we come into the world with diathesis or dispositions to different diseases, which are in the essence of the nerves and blood. An accidental irritation, and deleterious cause, either temporary or lasting, has power on the economy, by vitiating these two elements, if they have not been vitiated before birth.

It is the same with children as with plants, if the seed be sown in good ground, it is well developed; if the earth be bad, the plant is weak. While children are placed in favourable conditions, which act on the whole economy, and are in a healthy atmosphere, moderate temperature, enjoy the benevolent rays of the sun, take suitable exercise, and food is adapted to growth—if they be born healthy, they will thrive. But if born with morbid predispositions, the favourable situation in which they may be placed, cause the healthy elements to predominate; the impure fluid which runs in the veins is neutralized; and life becomes more strongly fixed in the organs, which expand freely.

But if a child comes into the world with a weak or vitiated constitution, and is placed in situations differing from those we have described, what will be the result? Deprived of the benevolent influence of physical agents, evil predominates over good, the scrofulous or tuberculous

element is speedily developed, growth is slow and irregular, the blood is aqueous; the complexion of the individual will be pale and discoloured, because the lymphatic fluids predominate; there will be general weakness, and the least accidental illness may cut down the tender plant, withered at its birth. So powerful is the influence of physical agents, that if a child born healthy is placed in the same unwholesome situation as the scrofulous or tuberculous child, its constitution, during infancy, is not sufficiently strong to offer resistance, and if it does not droop immediately, it soon has to pass through the series of evils we have described.

It is during growth, that morbid predispositions or hereditary tendencies require attention, for at that period the sanguine particle may increase and modify the organs; new elements may then be added to the constitutional elements of the blood. We must, in short, return to this truth, as ancient as the world, that Moses, as a physician and philosopher, expressed, by saying, "the blood is the life of the flesh."

We do not here treat of inflammation, which may be considered as an excess of nutrition of growth; there are children who come into the world with inflammatory diathesis, which good regimen and suitable care may moderate, but which is more in the province of the physician than parents.

Scrofula.

We have, in the course of this work, already alluded several times to a scrofulous state, yet we are of opinion that it does not suffice merely to name the existence of such a state, but that we must endeavour to shew the means of improving the constitution; and putting aside all fear of being taxed with repetition, we shall devote an entire chapter to this subject.

When the blood of an individual is aqueous, but slightly coloured, and all the tissues of the economy seem to languish, the temperament may be considered lymphatic: of all predispositions to scrofula, none is more striking than that of this species of constitution. Whether a child be the offspring of scrofulous parents or not,—whenever the tissues are pale, and there is a want of elasticity, the preponderance of the white vessels, contrasting so forcibly with the inactivity of the arterial system and the impoverishment of the red blood, shews a predisposition to scrofula. This predisposition will be so much the more striking if the child be subjected to the many causes that alone produce scrofula

Some authors are of opinion that scrofulous affections are but the excess of lymphatic temperament, others have attempted to disprove this particular state of the constitution, but without success; and Mr. Guersant, so many years at the

head of the hospital for sick children, wrote as follows:—"Children, who have a fine transparent skin, pink or wan complexion, large face, lower jaw square; lips thick, swelled, chapped, painful, and often inflamed during the cold weather; those children who have the eyelids red, and the edges covered with mucosity, long eye lashes, large blue eyes, and from infancy have had eruption on the scalp, the face, and behind the ears; those who have frequent swellings of the glands of the neck, and though very stout, are yet weak, and who have more imagination than physical strength, are certainly in circumstances most favourable to the development of scrofula." How difficult must it be to separate this lymphatic state from the commencement of a scrofulous affection, if so able a physician as Mr. Guersant mistakes it, and was not aware, that in describing the lymphatic constitution, he described the first degree of scrofula.

It is sometimes very difficult to make parents understand their children's situation, and this difficulty naturally creates an insuperable objection to any change in the mode of life, and to any improvement in the constitution.

We were, some years since, called to attend lady A. B. then about fifteen; she had light hair, large face, fine white skin; at times one of her cheeks were much coloured; blue eyes, tonsils swelled, breathed through the nose, deaf; the glands of the neck much swelled, more on the

left than the right side; one cheek appeared larger than the other; this young lady was remarkably awkward, and there was lateral deviation of the spine; the intellectual functions were not developed, as in some scrofulous subjects. After seeing this young lady's mother several times, we were asked our opinion of her daughter, and, without hesitation, replied that her constitution was lymphatic, that there was predisposition to scrofula, and that it would be desirable to endeavour to change the constitution. Lady —— seemed more shocked than distressed.

A physician, well known as a courtier, was called, and gave as his opinion, that the state of the young lady was due to the smallness of her veins. The courtier knew too well the effect of the *true* word, scrofula, and was careful not to pronounce it; he continued to attend the patient: shortly after, some glands on the neck broke, and abscesses were formed. Another physician was called, and though rather late, improved the constitution.

It is equally difficult and dangerous to speak truth to the great; but as this work is expressly meant for those who seek truth, and who know that riches and grandeur are not shields against the miseries common to all mankind, and principally the physical miseries of a bad organization,—endeavouring to describe the characters by which might be distinguished—not decided scrofula, for that is too well known, but pre-

disposition to scrofula, the picture we have drawn of Lady A. B., might serve as a model, were it complete.

Natural weakness, the lymphatic state of all the tissues, slowness of growth, size of the head, and its want of proportion to the other parts of the body, thinness of the lower limbs, thickness of the joints, and swelling of the abdomen, are the primitive signs of predisposition to scrofula in children. Growth is generally slow in this case, and the teeth are not cut at the usual time; in some children growth is rapid, but the teeth are not cut early.

Scrofula seldom appears the first twelve-months after birth, though Hufeland asserted to the contrary, and related this circumstance as proof of heredity. Alibert remarks that the whiteness of the skin of scrofulous individuals contrasts with the red colour of the cheeks; these colours are not mixed as in the fine works of nature, they rather resemble those in fine wax statues.

The skin of the arms and hands is fine and transparent, and the veins blue, the hair is mostly light or red, but fine and shining. The eyes are generally blue, the pupils dilated, the eyelashes long; there is frequent running from the nose and the ears, the tonsils are often swelled, there is deafness on one or both sides, and stoppage in the nose; thickness and liability to chapping of the upper lip and nostrils. In many

cases we find the strumous diathesis in individuals of small stature, with slender limbs, and it is not very uncommon in such individuals to find some member or organ imperfectly developed; but we also find scrofulous diathesis in some well developed individuals.

There is a scrofulous diathesis differing from that we have here sketched, which Baron Alibert termed endemic scrofula. The first is developed in large cities, the second in unhealthy climates, and in swampy and damp situations. In the latter case, scrofulous persons have a yellow skin, thick, wan, short stature, thin body, the eye livid, and the individual seems wasting away; while, in the preceding species of scrofula, the intellect is more than usually developed; in endemic scrofula the conception is slow; and many scrofulous persons are almost idiots. Such are the general characteristics of scrofula.

As innate scrofula, or scrofula developed after birth, by the influence of physical causes, may destroy the regularity of the phenomena of growth, it is essential to be fully acquainted with it. Scrofulous diathesis requires particular care; the human plant must not be left to grow unassisted; it must be placed in suitable conditions; merely to cast a glance on the cause of scrofula, may serve to shew parents the best method of improving children predisposed to these diseases.

But if it be asked, why scrofula is so com-

mon in infancy, it may be said, that in infancy the weakness of organization, the extreme sensibility of the young individual, the lymphatic temperament so common at this age, and the slight resistance of this organization, against the deleterious influence of certain agents, is a sufficient explanation.

Hereditary or predisposition to scrofula is a fact incontested in the present day; but scrofula may be innate in some children, though the parents be not scrofulous, if during the period of conception they were suffering from disease, or were at an advanced age, or if the mother had undergone physical or mental sufferings during her pregnancy.

A child born free from scrofula, may contract it after birth, if exposed to the numerous causes which debilitate and impoverish the constitution. Thus, the milk of a nurse either scrofulous, or otherwise diseased, or milk too old for a newly-born infant may bring on this malady. Hufeland considered artificial nursing as a frequent cause of scrofula. Dr. Cumming is of the same opinion, and adds that too great a delay in weaning may have the same results. If a mother be robust and healthy, she is culpable in bringing her child up by hand; but if not, and she is unable to procure a good nurse, artificial nursing may be resorted to with advantage, and cannot produce scrofula, unless combined with other circumstances. Thus, if milk be not

natural, if the nourishment be unwholesome, if the child be exposed to cold and damp, these combined causes may produce scrofula.

Various examples might be brought forward, in support of artificial nursing, as incapable of producing scrofula, without a combination of unfavourable circumstances. It may be considered as a general rule, that whatever induces weakness, may predispose to scrofula; and the too frequent administration of opening medicines may, therefore, have this result. Serious diseases, and particularly eruptive maladies, may accelerate the manifestation of scrofula, and vaccination, cannot be too strongly recommended, as one of the most invaluable gifts science has conferred on humanity.

The causes most commonly engendering scrofula, are those arising from improper physical education, and ignorance of the importance of physical agents on animal organization. Most ancient towns were constructed without reference to the salubrity of the public; the safety of states required that towns should be enclosed in narrow limits, that they might be defended more easily; but while precautions were taken against a foreign enemy, more dangerous ones were to be found within, who shewed themselves in the shape of direful plagues, so common in the middle ages.

It is in towns, where streets are narrow, and houses elevated, where the sun scarcely pene-

trates, and the air does not circulate freely, and where the damp is constant, that scrofula is found to prevail. It is in the old town of Edinburgh, in those numerous alleys, called closes, where there is but little day-light; it is in factories, where children are confined to unhealthy work-rooms, where the air is not renewed, and the rays of the sun do not reach, and where children are weakened by excess of labour and want of good nourishment, that scrofula is most common.

The heat of factories, a heat resembling that of hot-houses, and which debilitates young subjects exhausted with excess of labour, may induce scrofula.

Cold may also have an unfavourable influence on the scrofulous. Mr. Baudelocque remarked, that from the month of October, the state of scrofulous patients, at the hospital of sick children ceased to improve; and that during the winter, they lost what they had gained during the summer. Yet Mr. Baudelocque thinks that it is not to cold alone that the increase of scrofula must be attributed; but during this period, the remaining in bed, the want of exercise, and the habit of breathing impure air, are causes of higher importance than cold.

Dampness of situation, absence of sunshine, want of exercise, powerfully influence scrofula; change of climate, leaving a warm country, well exposed to the sun, to inhabit a

damp soil, often changes the natural constitution. We have, in our own practice, had many opportunities of observing children brought from Jamaica, or the East Indies, in whom symptoms of scrofula were manifested, by paleness of the tissues, weakness of the osseous and muscular system, and by swelling of the cervial glands.

All authors have spoken of unwholesome air as cause of scrofula, and Mr. Baudelocque has carried this opinion to a greater extent than any of them. It is to the imperfect oxygenation of the blood, that he traces the principal causes of scrofula, and this imperfect oxygenation he attributes to the vitiated state of the air, whether children sleep in places where the air is not renewed, or that they pass their days in damp and unwholesome abodes. Mr. Baudelocque has strenuously insisted on the danger of allowing children to sleep with aged persons, or having their heads covered over with bed-clothes, as the air they breathe is not fit to oxygenate the blood.

It has been justly thought, that confining many persons in the same room, produced impure air, and, on this account, schools cannot be too well ventilated. "The development of king's evil," says a learned author, "is very frequently due to a prolonged stay in apartments where the air is not renewed." When it is known that this disease never affects persons whose employments keep them in the open air, and that those who breathe air that is not sufficiently renewed, are

subjected to this malady, are we not compelled to admit, that the non-renewal of air must necessarily produce scrofula?

According to M. Baudelocque, scrofula is due to the imperfect oxygenation of the blood, caused by the vitiated state of the atmosphere. We are far from denying the importance of the alteration of the air in the oxygenation of the blood; but we do not agree with M. Baudelocque, in thinking, that air alone may produce this effect. When it is known that the section of a cerebral nerve may also prevent the oxygenation of the blood, nervous and moral influences must be admitted as causes of vitiation of the blood.

It is certain that scrofula prevails among the poor, who are deprived of all the normal elements necessary to the preservation of health and life. It is among the poor, whose dwellings are cold and damp; who want fire and covering, and the genial warmth of the sun; who require wholesome food to repair the waste of the body, and to restore the power of reaction. It is among the poor, who want shelter, clothes, and food, that scrofula is most common. Among artificers, residing in ill-ventilated work-shops, not exposed to the sun, this disease also prevails; one of its most striking symptoms is the *étiolement* or whiteness of the skin.

An author, who has sought to defend the factory system, and who, by specious reasoning, has attempted to withold the existing

abuses, Mr. Ure, has replied to those who attributed the imperfect development of some individuals to absence of good air and light, that *some* manufactories were well constructed, according to the rules of hygiène; but the number of these manufactories is very limited; and it would be equally correct to uphold the advantages of slavery, by bringing forward the example of one humane master, who treated his slaves as a father. But in manufactories there is more to blame than want of free circulation of air: how are we to qualify the slow infanticide of which manufacturers are guilty?

"The first effect of forced labour," says Dr. Farre, "is to injure the organs of supply, commonly the organs of digestion. The absorbent system is divided into two branches, one employed on the alimentary canal, to live on things without us; the other employed on the whole of the animal body; and there is a balance between these two functions, so that if the lacteal absorption be impaired by over-labour, the lymphatic system immediately begins to absorb the body; and this will explain why the body becomes not only pale, but thin. If the labour be pressed, the absorption of fluids is succeeded by the absorption of solids, the fibre is taken up, and thus the muscular fibre is diminished. If the labour be still further pressed, the earthy matter is absorbed, and the bones bend; thus by premature labour, the child is robbed of its blood, of its muscle,

and of its bone; it is crippled for life, and both in the male and in the female, the species is deteriorated." Let England, therefore, cease to boast of having abolished the slave-trade, while so disgraceful a compact exists as that of the factory system for English children. According to the energetic expression of Dr. Farre, the child confined during twelve hours at a tender age is "robbed of its blood, of its muscle, and of its bone."

Dr. Humbolt has named electricity as causing scrofula, but his opinion is not founded on any conducive facts.

The two great sources of nutrition and life—air and nourishment, are undoubtedly the principal causes of scrofula; and with these causes all the others we have enumerated are sometimes combined.

To this state of the constitution, to this scrofulous diathesis, what shall we oppose? A well-directed physical education. In the first place, pure air cannot be dispensed with. Whether in town or country, the place of habitation is of the highest moment. Lycurgus had wisely commanded that children should be brought up in the country till they were five years old; and for those predisposed to scrofula this point is indispensable: the observations we have made at the article climate are here essentially applicable; the bedroom must be spacious and well-aired, and with a southern exposure; children

must not, as Rousseau says, lie on boards; but on straw, or fern leaves, and not on feather beds; persons having the care of children should see that their faces are not covered with the bed clothes, that they may not inhale impure air. Damp situations must be carefully avoided for scrofulous children; the frequent use of a flesh-brush will be found beneficial, and the strictest cleanliness cannot be dispensed with; warm clothing, and flannel next to the skin, may give activity to its functions.

As to nourishment, good bread, and meat at least once a day, small portion of vegetables, wine, or bitters, are well suited for children threatened with scrofula.

All authors agree as to the propriety of keeping children, predisposed to scrofula, in exercise. Recamier advises a constant change in their recreations; gymnastics are specially useful; but if there be no possibility of procuring these most beneficial exercises, children must be left to play in a large garden or field.

Dr. Satdesgalliere relates a striking example of the development of scrofula caused by locality.

There were twenty young ladies residing at a school; the house was spacious and airy; their food was wholesome and nourishing, and they had the benefit of a large garden, where they ran about every day. All the scholars enjoyed perfect health for some years, but at the beginning of the winter of 1826 the garden no longer belonged

to the establishment, and the play-hours were passed in the school-room; they were suddenly deprived of the salubrious exercise which they had hitherto enjoyed; their health declined; twelve among them soon shewed symptoms of scrofula, which was only cured when they followed their usual exercise.

When children are prematurely subjected to extreme labour in manufactories, and their health has been injured, pure air and exercise in the country can alone restore them. Shampooing, just recalled into notice by Dr. Recamier, in the treatment of spasmodic contractions, may be employed with considerable benefit in scrofulous diathesis; whatever can give activity to the functions of the skin, such as gentle frictions, shampooing, and sea-bathing, should be prescribed with discernment for the improvement of scrofulous diathesis.

Gymnastics have been recommended as powerful means of preventing scrofula; in our opinion, gymnastics are very dangerous unless under special direction; for the bones of the scrofulous have sometimes a tendency to swelling or to caries; the articulations are large and weak, and much disposed to purulent collections; the ligaments are distended and weak: applied indiscriminately, gymastics are a fertile source of deformities and deviations. We have been frequently consulted for young girls who were deformed through an injudicious use of gymnastic

exercises: we have already stated that when under a proper direction gymnastics may be of the highest possible benefit, but the general state of the constitution must be previously modified. Many surgeons who have not sufficiently studied the subject they have to treat, and are therefore unable to give a useful and enlightened opinion, frequently recommend the use of the triangle for young ladies predisposed to scrofula: the deviations for which the triangle was advised are mostly increased by this exercise; and we strongly recommend parents to guard against this danger.

Excess of intellectual occupation, strong mental emotions, may disturb the economy, and admit the development of the predisposition to scrofula.

It is not our desire to treat this question for the faculty alone; our observations are intended principally for parents, and we confine ourselves to recommending the judicious use of all physical agents. But if the disease be once seated in any organ, parental care will not then suffice; medical assistance cannot be dispensed with: the efforts of nature will not cure those glandular swellings on the neck, which if not properly treated, break, and leave indelible scars, which are incompatible with beauty.

CHAP. IV.

Rachitic Constitutions.

Most authors have considered this diathesis as a variety of the preceding disease. At the commencement of the seventeenth century this affection was commonly known in England under the denomination of Pott's malady, and on the continent it was termed the English disease. It first appeared as an epidemic in Dorsetshire and Somersetshire, was speedily propagated through England and the north of Europe, and no measures were taken to arrest its progress. Towns were still surrounded by high walls, and deep ditches filled with stagnant water, the people crowded in narrow streets and damp habitations, wanting air and light. With such a combination of circumstances the evil could but extend and increase, and the heart sickens at the description of these ancient towns when visited by this scourge.

Examples are related of children born with rachitis, but this disease is seldom manifest till after dentition; it is when children begin to walk that parents perceive the bones of the legs are weak, and may be said to bend beneath the weight of the body. Rachitism is a disease of the bones; the whole system may be influenced by it; and

the development of children thus affected is mostly tardy. As age advances, the growth of the bones does not keep pace with the growth of the tissues of the economy, and deformations ensue. Rachitism is mostly manifested after any disorder in the functions of the economy, whether of the cerebral or digestive apparatus; thus the progress of growth is sometimes arrested by convulsions, sometimes by the state of the digestive functions.

Rachitism being a disease of the blood, in which the fluids are wanting in plastic, perhaps also in phosphate qualities requisite for the consolidation of the bones, it is therefore mostly to the alteration of the blood that we must seek the cause of this disease, and thus admit the same causes for rachitism as we have done for scrofula—heredity, unwholesome nourishment, impure air, damp habitations; and although it must be allowed that the children of the opulent, who want for nothing, are often affected with rachitism, owing to the weakness of the fluids, which affect the blood; nevertheless, the great influence of physical agents, so strongly manifested on the whole animal race, must be acknowledged. For instance, is not incurvation of the bones often seen in flocks of young ducks and goslings, when continually exposed to damp and rain; and also in young hounds, kept in damp kennels? The influence of physical agents and of nourishment will be found in all diseases, whether of man or

brutes, though the manifestations are not always the same.

A child threatened with rachitism, becomes pale and thin; its limbs are small and the joints large, quite out of proportion with the other parts of the body. A child thus affected, who has not yet learnt to walk, cannot support the weight of its body; the legs hang down, as the child is incapable of communicating to them the necessary movement and strength. If the child has already walked it can no longer do so; dentition also is late when there is predisposition to rachitism. Not only are the limbs weakened, but both sides of the chest are flattened, the sternum projects, and we have what is termed a pigeon chest, which is always an unhealthy conformation. It is not merely the long bones and the ribs that are modified, but the vertebræ also; and the child, unable to maintain its equilibrium, falls either to the right or left, and becomes deformed. The width of the chest is diminished, the functions of the lungs and heart are confined, and life is curtailed. A time comes when not only the bones are softened, but their substance is so deeply altered, that caries of the vertebræ is the fatal result; for the powers of art seldom suffice to arrest the progress of this fearful disease. When children do not perish before the age of puberty, a favorable change may sometimes take place; the

efforts of natur eare increased, and the imperfect organization is improved.

Rachitism has been frequently remarked as common in some localities. The recommendations that can be made for children predisposed to rachitism are confined to general observations; for instance, a good nurse, country air, attention to prevent all serious diseases, and not to make infants walk too soon. Our observations on scrofula are equally applicable to rachitism; but in the latter case no gymnastic exercises should be allowed. Dupuytren recommended champooing and pressure on the deformed chest, to bring it to its natural shape. We do not advise gymnastic exercises in cases of rachitism, because they cannot be employed with advantage when the bones are unable to render sufficient support. To fortify the constitution and improve the state of the blood, are the only rational means of preventing, and even of curing, rachitism. This disease is rather in the province of medicine than in that of maternal physical education.

CHAP. V.

Consumption, or Tuberculous Diathesis.

THE existence of tuberculous matter in the blood is no longer doubtful, since it has been found in the sanguine vessels, in the spleen, and in the lungs of the fœtus. This impure mixture, which passes from generation to generation, and annually decimates the population of great cities, as though a regular plague had been substituted for those occasional scourges which spread terror among the ancients; this impure mixture contained in our fluids, and brought in action by unfavourable circumstances, cannot draw too great a degree of attention from physicians, legislators, and parents.

Are there any means of preventing consumption? Can physical education modify constitutions fatally predisposed to this direful disease? These two questions are of the highest moment, and their solution is of the deepest interest to humanity; we shall endeavour to elucidate them as fully as it is in our power, according to the actual state of science.

In all constitutions, where there is a morbid diathesis, and where the principle of the evil is to be traced to the blood, and is developed with growth, the first of all duties is to watch over marriage. What can result from the union of unhealthy individuals but a sickly off-

spring to whom life will be a burden? If it be remembered that the direful effects of consumption are felt in the spring of life, after a fortune has been spent on a child's education,—when this child has been the object of unceasing cares, and parental love, it must be allowed that, of all diseases, this is one of the most cruel for parents. To lose a child in its infancy, is a source of great sorrow, and the trial is deeply felt; but to be deprived, by death, of a son or daughter in the bloom of life, is indeed a fearful bereavement, and no language can express the grief of a father, nor the more deep and lasting anguish of a mother, on such a trying occasion.

We have strongly insisted on the necessity of placing children in conditions suitable to their development; but if, nevertheless, they have the full enjoyment of all the benefits resulting from physical agents, it will not always prevent their being victims to consumption; what is then to be done for those who come into the world with this original stain?

In this, as in the preceding cases, the first step to be taken, is to obtain a good nurse; the infant, (if we may be allowed the expression,) must be grafted on a new constitution. It will not suffice merely to procure a healthy nurse, but the state of her health must be carefully watched during the whole period of her nursing the child; her diet must be regulated

her food nourishing, her mind at ease; she should take regular exercise in the open air, and be preserved from all sudden emotions, violent passions, or mental distress. We do not think early weaning advisable.

Let us now suppose the child has reached the age of seven, and has happily passed over the periods of first and second dentition; what then most tends to create fear of predisposition to consumption, is the conformation of the chest.

The injudicious custom of confining children in tight clothes greatly contributes to prevent the expansion of the chest. We had lately an opportunity of observing a child whose chest was narrow and less developed than the remaining part of his body; we ascertained the cause to be due to the shape of his dress, which was immediately altered, and gymnastic exercises were advised. In the course of a few months, the improvement was remarkable, the chest had acquired more width; the pectoral and dorsal muscles in constant play, considerably increased the pectoral cavity.

Some children have the chest narrow towards the upper part, in others it is flattened anteriorly, or on both sides, and forms what is termed a pigeon chest; sometimes it is flattened, and shortened on one side only, and there is a curvature of the spine. How then, can the lungs fulfil their functions with ease? It is, therefore, to the conformation of this organ that all our

care must be directed, and orthopedic gymnastics alone can furnish means suited to the attainment of this end. Suspension by the hands, when there is not weakness of the cartilages, and various other exercises, advised for spinal deviations, nearly always existing simultaneously with narrowness of the chest; sea bathing, dry frictions, champooing on the chest, as recommended by Dupuytren, and the general internal remedies calculated to strengthen the constitution, are of immense advantage for children predisposed to consumption.

We are well aware that these are but general means; but these means, sterile in the hands of common individuals, may have the most favourable results, under able management. Let a trial be made of gymnastics, champooing, and reading aloud, without carrying these exercises to an excess, and inducing too great a degree of fatigue. According to Plutarch, Herodicus cured himself of consumption by gymnastic exercises.

The lung is an organ that can be *educated:* we have frequent examples of the kind in singers. We have already cited the celebrated Cuvier, and Larive, the actor; similar instances are numerous, and lost only to those in whom the faculties of observation and reflection have not been duly cultivated. We shall, perhaps, be told that consumption is a vitiation of the blood, which is only evident when any unfavourable circumstance occurs. We admit the fact, and shall

merely say, it is because phthisis is a disease of the blood, that the blood must be improved; and for that purpose, it is well to seek a purer source than that from whence it sprung: but more is requisite, for, as phthisis acts principally on the lungs, and that it is the affection of this organ which so often proves fatal, we must strengthen the lungs, and render them less susceptible to cold, and coughs, which may be considered as the forerunners of consumption.

The functions of the skin are in constant equilibrium with those of the lungs. If there be disorder in the functions of the skin, the lungs are influenced by it. If we observe the skin of those persons predisposed to phthisis it will be found very delicate and soft; it is considered beautiful, but is always cold, principally at the extremities; there seem to be no pores, the functions are performed inwardly, and the lungs suffer; for they have thus to fill a double part, while they are confined in a cavity too narrow to admit of their full action, and they naturally become the seat of disease, when a predisposition already exists in the blood.

When eruptive diseases are arrested in the development, they tend to increase the disorder of the lungs. If small pox, measles, scarlatina, have not their full outward development, the lungs suffer. It is worthy of notice, that persons who have had confluent smallpox, die of consumption, if the

pustules do not fill well. Is there any analogy between the eruption in small pox, and the tubercles of the lungs? In warm climates, where the functions of the skin are easily filled, and in cold countries, as in Russia, where vapour baths are used until violent perspiration is induced, consumption is far less common. It may, therefore, be naturally concluded, that a greater degree of attention to the functions of the skin, would relieve the lungs; there would be a sort of derivation, and participation of action between the lungs and the skin. Nothing is more contrary to the health of young girls, than the habit of wearing low dresses; the lungs must necessarily be affected by this species of direct subtraction from the perspiratory functions.

It was the genius of evil that first introduced this pernicious fashion: what can be more calculated to produce irritation of the lungs, than to expose the neck to constant variation of temperature? Low dresses and short sleeves, are more generally worn in England than in any other country; and England also has the fatal privilege of numbering among its inhabitants more victims to consumption than any other nation on earth.

It is not only during early infancy that it is dangerous to confine the chest, but at all ages. When young ladies *come out*, they are subject to torture that reason disapproves, and that cannot be too strongly condemned; we gave our

opinion in favour of stays, which *neither affect respiration, circulation, digestion, nor motion.* But we cannot sufficiently disapprove of tightening the waist till the blood rushes from the surface of the body towards the heart, lungs, or head, and produces congestions, which are ever of a serious nature. To have a tight waist, a confined chest, difficult respiration, and to dance in that state, is wilfully to bring on an affection of the lungs; and if there be predisposition to phthisis, this practice cannot fail to give rise to spitting blood, which is a very serious symptom.

We have entered fully into the means of strengthening the lungs, by the exercise of the organ of the voice. The sound produced by the expulsion of air from the lungs, vibrates in the chest, and has a salutary effect. The dumb often fall a prey to consumption, while this disease is of rare occurrence among singers. The study of declamation and singing should form a prominent part of the physical education of young persons predisposed to phthisis. Dr. Autenrieth recommends deep and frequent inspirations, as the means of enlarging the pectoral cavity; but these deep inspirations or inhalations can but produce fatigue. All peculiar exercises, recommended for the improvement of health, should be so arranged, as to form a recreation for the young invalid: to make deep inspirations during half an hour, would be rather considered

as a punishment than as an amusement. We should like to find an author who would make a pleasing collection of stories, with gradual sentences, necessitating progressive inspirations, and if read aloud, they would answer a good purpose.

If it be important to give to infants healthy nurses, having good milk, it is not less essential to give good nourishment to older children. Consumption is very common among the poor; among the rich, many mothers will not allow their children a sufficient quantity of food, in order to keep them in a delicate state, and make them look genteel! Whether for rich or poor, the want of sufficient nourishment must have the same results. During growth, children require more food than in the adult age, and it is cruel to deprive them of it through system. Roast meat is peculiarly wholesome, and the gravy excellent, even for very young children.

The situations in which young persons are placed, have the strongest influence either on the manifestation or production of consumption. All professions, in which particles of an irritating matter may be inhaled, are to be feared for delicate chests, and should, if possible, be given up.

Climate has ever been a subject of study, as regards persons predisposed to consumption, or already suffering from this direful malady; it results from the comparisons of the advantages

and disadvantages of situations, that England is, without exception, the very worst place in the world for the consumptive. London, as the centre of all misery, excitation, and want, shews in the bills of mortality, a fearful number of victims to consumption. London fogs, the impurity of the air, the insalubrity of the kitchens, built under ground; the wretchedness, and vicious habits of the lower classes, and the sudden changes of temperature so common in England, render this climate unfit for the residence of the consumptive. But dress, hygienic precautions, flannel worn next the skin, the exercise of all the organs that strengthen the body, combined with wholesome nourishment, may assist reaction against the inclemency of the climate.

The general principles, by the aid of which physical education may modify constitutions fatally predisposed to consumption, are a healthy nurse, an airy habitation, sun, air, exercise of the pulmonary organs, freedom of all movements for the chest, exercises of the muscles, frictions, and champooing over the whole body, but principally on the chest, orthopedic gymnastics, gentle exercise on horseback, and on foot, ease of mind, and absence of fatigue.

As to climate, we repeat, that any one is preferable to that of England, and no place can be less suited to the consumptive than London.

Dr. Wells brought forward an opinion that would have been consolatory for the consumptive;

he thought marshy countries where intermittent fevers were common, would be favourable for invalids affected with phthisis; this point has been contested, and Dr. Southey pointed out Egypt and Persia, as the land of promise for those suffering from this malady; but his authority does not suffice to induce invalids to emigrate to such distant countries.

The climate of Algiers has also been lately recommended, but more facts are requisite to justify the encomiums so recently lavished on the southern coasts of Africa. For our own part, we think with Laennec, that the sea-side is by far the most desirable residence in these melancholy cases.

The diathesis we have described have seldom a marked character; they are mostly so complicated, as to increase the difficulties in physical education; but experience has shewn, that children not only require common, but peculiar care. What precautions are not necessary in early infancy to prevent convulsions, and all the cerebral affections, which seem mutually engendered! What discrimination is not requisite to direct gymnastics, for those affected with or predisposed to scrofula! How many resources are to be found in suitable exercises for the development of the chest, the narrowness of which would alone suffice to prevent the full expansion of the lungs, and bring on consumption! It is therefore, impossible to recommend to all chil-

dren the same means, for all children are not alike.

While advancing in the study of physical education, we shall often have to notice the immense influence of the diathesis of which we have spoken, in producing numerous deformities of the spine, and other parts of the body.

Thus, the more physical education is studied, the more complicated it proves. The infant coming from the hands of nature is not always healthy, and there would be but few opportunities of applying the precepts and sophisms of the philosopher of Geneva, if they were only calculated for children who come into the world with the original perfection, nearly alike to that with which the first man came from the hands of God.

CHAP. VI.

On the causes of Constitutional or acquired Deformities.

THE most common source of deformity is, without doubt, to be traced to the state of the constitution. With a scrofulous, rachitic, or tuberculous diathesis, or with an anormal development of the nervous state, accidental causes are not necessary to produce deformity. Deviations in the anormal state may then occur without any accidental, or apparent cause; and it is for this reason we gave so much importance to morbid diathesis: it is certainly not possible to obtain perfect cures, and to restore deviations, unless the economy has acquired sufficient strength to maintain them. General health, or what is termed the normal state of the body, is the first condition for all cures, or for the return to the regular laws of organization. All attempts to straighten the spinal column will be useless; the cure will be but temporary, unless the tissues of the economy have acquired normal vitality and strength: a spinal deviation cannot be permanently cured if attention be given to the spinal column alone. One particular organ cannot be isolated from the whole economy; it cannot be freed from the general influences acting on the whole human frame. But it often happens, that

if a deviation be noticed in its early stage, by strengthening the general health the deviation will be cured. In all times orthopedists have failed in this respect, particularly those who do not belong to the faculty, and who only have recourse to local means, in cases where enlightened care is imperiously demanded.

It is an error to suppose that in the morbid changes which take place in the economy, the effect is visibly connected with the cause, and that it is easy to trace the one to the other; the disorders of the functions, and of the organs, are not like those of physics and mechanics; there is more in the economy than mechanism,—more than mere bones and muscles; and there are numerous phenomena to which the laws of physics cannot be applied.

Deformities or deviations from the normal state have several sources; the state of the constitution, which predisposes to every sort of deviation; the diseases which weaken the economy, and render it susceptible to all the influences of a bad education; or this mixture of attitudes and habits so often repeated, that, according to the vulgar expression, they become second nature. In the first case, deformities or deviations from the normal state sometimes appear at birth; at other times, they are developed during growth: in the second case, deviations or deformities are the result of disease: in the third case, they are the effect of attitudes and habits, which have very

great influence on weak constitutions, and more particularly on individuals born with morbid predispositions, or those debilitated by long illness.

In these different states, it must be understood, that it will not suffice merely to use apparatus to re-establish the individual; the question is not merely to draw the spinal column straight, but to give a proper degree of care to the whole constitution. These considerations will prove to parents, that the education of the anormal state requires an enlightened direction, and that the cure of deformities or deviations cannot be confided to drilling masters, nor men ignorant of the healing art. These observations are requisite before we discuss the causes, and the means of re-establishment.

The disposition to the curvature of the limbs and spine, depends therefore much on the primitive constitution, which has mostly a character of weakness easily discerned. It may be said that all weak persons are subject to spinal complaints, whether the weakness be constitutional or the result of any illness. "If we question any person afflicted with spinal diseases," says Dr. Duval, "we shall nearly always find that in childhood they have been subject to convulsions, that they suffered much from measles, hooping cough, glandular swellings, or some other diseases."

This fact once established, there would be

two things to consider in spinal affections.. First, the constitutional state, then local deviations, which are to be brought to their normal state. However simple this distinction may appear, the knowledge of the real cause of deformities offers innumerable difficulties. Drs. Bouvier and Delpech were of opinion that spinal deviations were the result of several combined causes, and that it was not always easy to discover and to explain them.

Indeed, to apply to the subject to which we now devote our attention a knowledge of the causes of deformities, is no slight task. For the muscles and bones to exercise their functions regularly, there must be physical and normal integrity of these organs: whatever may modify or destroy this integrity, may also modify the functions of locomotion and station. Thus the muscles and bones are subjected to all the causes that may act on the whole economy, and these causes are very numerous. Besides the morbid predispositions we have noticed, all external and internal agents, all those which modify the functions of nutrition and enervation, may also modify the structure, the solidity, and vitality of the bones and muscles. When the bones have not acquired a proper degree of solidity they are unable to bear the effort of the muscles; and if the power of the muscles be not equal, they act unequally on the bones, which if weak are easily deviated.

But the integrity of the bones and muscles does not alone suffice for the movements: at the commencement of some cases of paralysis, there is integrity of the bones and muscles, but there is no movement, because the nervous action is wanting: we may then again repeat, that deviations deserve not only peculiar attention but a high degree of knowledge; it cannot be said that deviations are caused by rachitis or scrofulous diathesis, or by bad attitudes only. Deformity of the body and deviations of the vertebral column are due to various causes; they very often originate in the state of the constitution, bad attitudes, and different diseases. We have studied, in the beginning of the third book, the most common predisposing causes of all deviations; but we cannot enter into the detail of every disease that may affect and deform the human body: it remains for us to treat of bad attitudes, which so frequently produce deviations when there is debility of the constitution. We must then bear in mind, that during growth, in the normal or anormal state, there is a certain degree of weakness; so that we feel more and more the importance of the study of the laws of growth.

CHAP. VII.

Attitudes.

One of the most beneficial results of education is undoubtedly that equilibrium established between the respective powers. Attitudes seldom admit of restraint without being in opposition to the great laws of nature, which have left the functions of the organs at full liberty; an erect posture is by far the best. The influence of attitudes is so forcible, that it has always a powerful effect on the conformation of the organs. When attitudes have become habitual they may be considered involuntary, and looked on as pathognomonic signs; or else they reveal internal sentiments, whose influence has deeply modified our most natural positions.

Attitudes not only considerably improve the countenance, but the whole figure; they are a substitute for speech, the foundation of the pantomimic art, which may be termed a universal tongue, and is the sole resource of all foreigners, who do not understand the language of the country in which they reside, or through which they may chance to travel.

Harmony of the shape, regularity of the proportions, and the charms of beauty, are considerably increased by graceful attitudes, which may be termed the physiognomy of the

body, and like the expression of the countenance, denote the moral sentiments, and physical affections; different changes of attitude reveal the internal state of the mind. The most common observer may have noticed that people in an inferior station of life denote their state of dependence and servility by their attitudes.

Women have more delicacy and a greater degree of mobility in their attitudes than men. There is boldness and decision in the attitude of the Apollo of Belvidere, while in the Greek Venus, and in those of Canova and Thorwaldsen there is a species of timidity and uncertainty perfectly consistent with female delicacy.

Attitudes are the natural consequence of the necessity of an equal distribution of the weight of the body, of the head and breast, round the central point of the basis of support.

Every sort of position, and every species of decubitus, have characteristic postures. Attitudes strikingly beautiful are those of the ancient statues; their perfection fully entitles them to be considered as models that may be copied with as much utility as nature, of which they are the faithful image. The motions and attitudes of the body are caused by its gravity and locomotive strength. When attitudes have become habitual they are frequently repeated; the younger children are, the greater is the influence of attitude on their conformation. It is easy to understand that a continual repetition of bad attitudes must

in a very great degree modify the effects of this situation. When the cartilage and bones have acquired their solidity, they may resist the contraction of the muscles and the weight of the body; but in very early life, when the bones have not acquired their full development, and their ossification is not completed, it is impossible for the frame to resist the united effects of the muscles and weight of the body.

Shaw, an English author, has attributed spinal deviations to habitual attitude. "The deformations of the bony system," says M. Bouvier, "which take place in youth, are principally owing to bad attitudes: the action of weight while standing, either singly or in conjunction with muscular action, explains these irregular developments; distortion of the limbs and of the spine, so common in growing children, leading to hypertrophy on one side, atrophy on the other, is the result of the mechanical influence of bad habits."

But however powerful this influence may be, we do not think that in the generality of cases it would suffice to cause deformity, unless there existed a predisposition, not of any peculiar nature, but of mere debility; or a want of equilibrium in growth. At every step we are compelled to observe the extreme importance of growth, and the principle we have emitted, that growth governs life, seems fully justified. Thus the predisposition that we admit

as necessary to cause deviation to result from bad attitudes, is not always the predisposition to any particular disease; muscular weakness, irregularity of growth arising from illness, suffice to engender it.

It is related in the Dictionary of Medical Sciences, that a young lady, twelve years old, was so persevering in her studies, that in her anxiety to keep up with her companions, she was continually writing or drawing; during this period she grew several inches, and could not stand upright; her spine was examined, and found straight, but the muscles had been too much exerted, which prevented the full extension of the spine.

An example has been given of two young ladies sleeping together, and always lying on the right side; they each became deformed, and were cured by being made to sleep on the left side; we do not admit that such a thing might occur frequently; there must have been a softness in the bones to occasion a deformity so easily, as well as a cure merely by a change of position. The manner of lying down may undoubtedly have great influence on the figure of a growing child; the unequal decubitus of different parts of the body is often prejudicial to erectness; and it is not only useful to change the position in order to avoid deviations, but also to relieve any part that has been too much fatigued.

To watch over children's different positions is essentially important, in order to ascertain the beginning of any deviation, which is always the more easily cured when early attention is given. But it is necessary to be acquainted with the reasons that render these attitudes good or bad, and the laws of equilibrium must be studied by those who have the care of children.

It is difficult to conceive how much strength is requisite to keep an erect position; it requires the aid of all the muscles to maintain a perfect equilibrium on so narrow a basis as the feet. If a child's first steps be observed, and the violent efforts made to stand alone be noticed, it will be evident that all the museles are in action.

The human body is composed of so many different parts that it cannot stand erect without each part weighing on its respective basis,—the head on the spine; the superior limbs, the chest, and the spine, on the pelvis; and the whole trunk on two moveable and jointed pillars. Perfect union must therefore exist between the muscles, in order to obtain an erect position; this marvellous attitude is still more wonderful when it is known that the manner in which the organs are situated is by no means favourable to it. The head is naturally inclined to lean forward on the chest, he chest on the pelvis, and the whole trunk on the pelvian limbs; so that by the effort of the muscles only can this difficult equilibrium be

maintained. Any accidental influence affecting the muscles makes the body bend. In infancy, in sickness, in old age, the muscles cannot support the body erect; and this explains the stooping in the two extremes of life.

It is very injudicious to keep children standing long; it is injurious to their growth and prejudicial to their figure. The muscles are fatigued, cramp arises, and great suffering may ensue. This remark is important for private governesses as well as school-mistresses, who should understand the impropriety of making children stand long, by way of punishment.

The basis of support is enlarged in the front when persons are seated; and it is then natural to lean forward, unless there be some support for the back. The observations already made on an erect attitude are applicable also to being seated, as far as regards the superior part of the body; but owing to the inequality of the basis, the abdominal muscles are fatigued when this station is too much prolonged. These simple indications plainly prove that forms and stools are not calculated for children; and it is surprising that they could have become the fashion, particularly for the piano-forte.

If some authors have considered the study of the piano-forte as liable to produce deviations, they may certainly be attributed to the use of music stools: there exists also another cause, which escapes general attention, viz., the

nature of the music now in vogue. A pianoforte, with six octaves and a half, has a certain extent; the body is continually bending backward and forward, in positions contrary to the regular development of the figure; the body leans forward, or to the right, or to the left, according to the passages to be studied, whether on the upper or lower octaves: these bad positions are essentially injurious to the shape, and therefore to the perfection of beauty. Herz and composers of the same school, in whose music there is more display than harmony, have created so many difficulties, that great perseverance alone can overcome them; Hummel and Beethoven's music is much better adapted for youthful study, not requiring such continual efforts, or destroying the natural equilibrium of the body when seated; we are aware that the continual motion necessary, may be considered as a species of gymnastic, but we must not judge from the attitudes of public performers, who play the most difficult pieces with surprising ease and brilliancy; we must watch growing girls, practising one line, or a single bar over and over again, for a considerable time, while seated in the same awkward position. The great object of muscular gymnastic is to exercise the pectoral muscles, to enlarge the chest, and throw back the shoulders; can all this be effected by crossing the hands, so that the left hand plays the

treble while the right hand plays the bass? We leave our readers to judge for themselves.

While writing these observations, we chanced at an evening party to hear a fashionable young lady play a very difficult piece of music; she evinced great taste and execution, and must have practised constantly to have attained so great a degree of proficiency; her performance was loudly extolled, and she deserved all possible praise; but her figure had been sacrificed, she was quite crooked, and this deformity, if not actually caused, had undoubtedly been increased by practising the piano-forte before the young frame was sufficiently strong to resist the power of different attitudes. An oblique position while drawing, playing the harp, or piano-forte, may cause a lateral curvature.

"I have seen," says Bamfield, "instances of lateral curvature, produced by a habit of long-continued inclination of the body after the adult age, in insane persons." In the young and growing this is a more common event. Young artists of both sexes are liable to lateral curvature from this cause, by adopting a habit of sitting before their paintings and drawings, inclining the body to the left side, with the left arm resting on the elbow, or hanging by the side; sometimes with the palet on the left arm, whilst the right arm and shoulder are raised for the purpose of directing the pencil, and the head is turned

towards the left shoulder; in this position the spine is kept in a state of lateral curvature.

It should be remembered that good attitudes are always the most desirable; parents and governesses should endeavour to keep children straight, whether they be sitting or standing; and as during the day divers exercises may prevent their erectness, it is essential not to keep them any length of time in a position which might distend the ligaments and synovial membranes, disturb by pressure the nutritive functions in one place, make them more active in other parts, and cause such durable changes in the constitution, that they finally become identified with the constitution itself.

In kneeling, the basis of support not being extended, it becomes necessary to lean, or the muscles of the spine, doubling their efforts to support the weight of the body, and maintain the equilibrium, occasion great fatigue and pain. Kneeling requires special attention, whether at church or at home; children must have some support when they kneel; persons who are not strong often faint away if they remain long in this position.

The habit of making children write or draw at the same table, without regard to their age or size, is most injudicious; it is singular that no one should have thought of having chairs and tables calculated for children's height. Nothing

can be worse than writing at a small desk. When tables are too much elevated, the elbows are necessarily placed too high, the arms and shoulders are the same; while the spine, the neck, and the head, seem all brought together. This attitude is extremely detrimental to the figure, and contributes greatly to displace the shoulders. Therefore to correct round shoulders by loose clothing, and easy natural positions; to have plain chairs with backs; hair mattresses instead of feather beds; a bolster, but no pillows; tables two inches higher than the elbows; no arm chairs; no music so difficult as to necessitate awkward positions that may cause distortion of the spine; to watch over the general attitudes both day and night, and endeavour to render them easy and natural; to avoid long kneeling; and to give support to the back when necessary, are the rules to be followed in order to ensure the proper development of the human body.

As to the attitudes resulting from illness, of which we have noticed some symptoms, they require peculiar attention when depending on general weakness. Mechanical and gymnastic means could not be had recourse to unless there existed sufficient strength on the part of the patient to bear their application. The advice of an enlightened physician, who has made this branch of science his principal study, and who would take into consideration the constitution, the growth, and any accidental circumstances connected with

the case, should be sought, as it is not possible to lay down rules suited to every individual.

To resume what we have to say on attitudes. Parents must be perfectly aware, that the positions most likely to produce deviations are those contracted during intellectual education; so that it is principally while writing, drawing, harp or guitar playing, riding, reclining on a sofa, or lying in a bed with the head elevated, that spinal deviations most commonly arise, when children have any of the four diathesis we have sketched, or are of a weakly constitution; but as it is only when bad attitudes become habitual, that they leave strong impressions, and cause deformity, we may here make some remarks on habits, without which the influence of attitudes is but temporary.

CHAP. VIII.

Habits.

HABIT is a disposition contracted by a frequent repetition of the same acts, causing different modifications in the organization. All our organs are not equally subjected to the power of habit, and some are never in any way affected by it.

But habit may powerfully affect the organs of animal life; "and the functions," says Bichat, "strengthened or weakened, seem to assume different characters, according to the period in which they are exercised."

In youth, habit has the privilege of modifying the primitive constitution, and injuring it so powerfully, as to render it incurable, unless this same habit be not overpowered by a contrary habit, acting slowly and constantly in the same manner as the first.

Lamark considered the power of habit so great, that he supposed the difference existing between human beings had been gradually brought on by the constant effects of the same influence.

Organized bodies seem exclusively capable of contracting habits; "man," says Cabanis, "is peculiarly liable to receive impressions."

All physical habits are susceptible of modifica-

tions; in the action of the organs, their peculiar inclinations, and characteristics of the living system, can be altered. "In short," says Cabanis, "it is certain, that the mode of life, whether it be good or bad, may either considerably improve or injure the physical constitution."

By the influence of habit, each organ may be strengthened or weakened; the impressions creating divers emotions, and which have a continual tendency to introduce new feelings, are also liable to undergo most striking changes. These observations relate to general habits; but to keep within the limits of our subject, which is intended to examine the influence of habit on the general development of individuals, we must observe, that no constitution, however strong, could combat the effect of bad attitudes which had become habitual. The slightest examination will suffice to prove this fact.

There are organs and functions that may be termed intermittent, and which are subjected to the power of habit; but there are others in continual activity; thus circulation, respiration, nutrition, never cease their functions; sleeping or waking, the heart of every individual beats; the air penetrates into the lungs, and makes them expand, nutrition takes place, there is a constant work of assimilation and secretion; the nutritive particles may deviate from their natural course, but their assimilating action cannot be destroyed.

If an awkward position be maintained during a long drawing or music lesson, the body inclined to one side, and the spine deviated, what occurs? The functions of nutrition are continued, but the side of the body that is bent, offers a striking particularity: in order to effect a bend, the vertebræ press on the cartilages that separate them; and as the cartilages on the inclined side are far more pressed than those on the opposite side, nutrition only takes place in one part; the nutritive particles are carried on the opposite side, where nothing occurs to prevent their assimilation; while on the confined side they cannot reach their destination. This phenomenon is often observed in ankilosis, and ossification of the fractures.

It is in youth, when a nutritive strength predominates, that habit has so powerful an influence, because the organs not having reached their full development, are more flexible, have less firmness, and receive a greater portion of nutritive materials.

One of the most striking effects of habit is exemplified in conjurors' children, who throw themselves back, and bend their spine in a circular manner, notwithstanding the obstacles offered by the natural conformation of the vertebræ, the spinal apophyses and ligaments.

All that has been said respecting attitudes, may be applied to habits; temporary attitudes leave no trace, but actions frequently repeated, constitute habit, which may appropriately be termed second nature.

Education, in its most comprehensive meaning, is but mere habit: its great art consists in only allowing good habits to be contracted. It is the fashion to condemn habits of any kind; yet habit is the most solid basis of education, and consequently the best foundation for future conduct; advice is forgotten—principles weakened by time, whereas, habits, on the contrary, are strengthened every day.

"There are," says Rousseau, "habits which, though contracted by main force, do not overpower nature;" for instance, plants have a certain direction given them, and when left at liberty preserve it, but the sap has not changed its primitive direction; and if the plant continues to vegetate, it grows vertically. The case is not similar with mankind; the inclinations arising from habit may, by change of situation only, be altered, and the natural position be restored.

Girls, when left to themselves, do not recover the erectness that has been destroyed by physical habits, particularly those that have occasioned deformity: neither is it through idleness, that a detrimental attitude is maintained; but habit has produced a change in the constitution, and the modification or alteration that has taken place in the organs, prevents the body being erect; there is a physical necessity for remaining crooked: it is useless to recommend a deformed child to keep straight; she may endeavour to make the effort, but following the bent of the acquired

organization, she immediately resumes the position that has become habitual.

The power of habit is so forcible, that when once contracted, and followed by a modification in the bony and cartilaginous frame, it is not possible to counteract it, unless by endeavouring to encourage new habits, by judicious means, well understood and scientifically applied.

If youth, owing to its weakness, and its growth, is the period when habits are acquired, it is also the time to implant good ones, or to correct those which may be injurious to the economy of which they have become a part.

A habit of muscular actions gives precision, constitutes dexterity, and leads to perfection in the arts; what is done frequently is usually well done; the organs often exercised acquire more power, more strength, more activity; the general rule is applicable alike to mind and body.

To give a good direction to habits, should therefore, be the chief object of *education;* but habits cannot be suddenly implanted, they must be the effect of time, gradual, and slow as nature in all its works. Good habits increase, and continual vigilance is requisite to watch over physical and moral habits; they form the manners, and prevent their degeneracy. Habits of occupation and exercise are the safeguard of innocence, and the surest pledge of health and beauty.

The intellect is strengthened by exercise, the

sensations of pain and pleasure are blunted by habit; and this is necessary, in order to leave the judgment at full liberty, and to admit of its being impartial.

We presume these observations will suffice to shew the importance of habit: they might, it is true, be more extended;—we could remind our readers, that even poisons lose their action from habit, as exemplified by Mithridates, and Mad. De la Brinvilliers; but we merely desire to consider the connexion of habit with the power of attitudes, on causing deformities, and to shew that good habits can alone counteract the evils arising from bad ones.

CHAP. IX.

The Mode of ascertaining Incipient Deviations and Deformities.

"MOTHERS," says Delpech, "are the first to discover alteration in the figure of their children;" their perspicuity, in this respect, is admirable, and has often given rise to delicate and ingenious observations; their solicitude has been mistaken for exaggeration, by superficial observers, who would do well to profit by the observations, originating in maternal solicitude.

Then again, it may with justice, be said, that mothers are blind to their children's defects, and that many deformities are not noticed until they become fixed; indeed, many parents will not allow that their children are deformed at the very time they seek, by the aid of stays and pads, to conceal their deformities.

In the opinion of Duval, deformities of the limbs, and some spinal deviations are evinced by unerring signs; no curvature of the limbs has ever been developed without having been produced by pains in the curved parts: and spinal deviations are almost always announced by pain in the part of the spine that will be deviated, which pain is sometimes felt in the whole length of the spine; this pain may last for weeks, nay,

years, without any apparent change, or marked deformity.

"Deviations are always accompanied in their origin, by pain, and a sensation of heaviness in the loins, in a part of the chest or epigastrium, dyspnea, palpitations; there are sometimes convulsive movements in the limbs, and contractions of the muscles, rather of the flexors than extensors." Some children, who have been subject to convulsions, squint suddenly, or have a tic; sometimes there is weakness in a limb, and the child cannot walk without support: most of these phenomena are due to a nervous state, dependent on the spinal marrow. At other times, spinal deviations are preceded by a general falling away; scrofula seems to predominate, the cervical glands are swelled, and the articulations enlarged.

"Bodily deformity mostly affects pretty girls; light hair, blue eyes, white skin, are the most common attributes of beauty in young ladies, and are indications of a lymphatic constitution, of which scrofula is the first result, and rachitis the last."

One breast larger than the other, is often an indication of deviation.

"When the spine of a girl, about fourteen, is becoming crooked," says John Shaw, "the attention of the mother, or governess,—at this age, it is most frequently to the latter,—is at first directed to the state of the shoulders, or breast; one

either appearing larger than the other, or growing so unequally as to lead to a suspicion that it is diseased; but in a child, the state of the right shoulder generally attracts attention, as it appears larger than the left, and when the distance of the two shoulder-blades from the spine is compared, it is found to be further removed than the other, or as it is often said, *growing out;* it may be noted, that the left hip is different from the right.

"If the spine, which has probably been overlooked by the mother, be now examined, it will be found curved nearly in the form of the italic *S*. The whole of the right side will also have acquired a rounded and barrel-like form, while the left is diminished, and contracted, the ribs being closer together than is natural; there is, moreover, a sinking in, or depression of the right, and a corresponding fullness of the left loin."

Delpech, very justly mentioned a sort of vague pain, sometimes seated on one side of the chest, at other times below the epigastric region. We have often had patients who suffered from this pain, which has sufficed to lead to the sup position, that a spinal deviation was to be feared, and it very seldom exists without slow, but progressive, falling off in the general health. By pain in the chest, which is often complained of by young people, we could indicate the commencement of a deviation, and shew the affected

vertebræ; thus, pain in the chest, or heart, sometimes indicates a change, an alteration in the fourth dorsal vertebra; when the pain is near the liver, the eighth and ninth dorsal vertebræ become deformed, or undergo some change. Pain in the lumbar vertebræ is always connected with general weakness, and the tuberculous state of the spine is often indicated by acute pain in one side or the other, or by fixed pain in one or in several vertebræ.

Delpech also considered asthma as a symptom, in children of eight or twelve years old, when the attacks were periodical.

There is seldom an alteration either in the shape or texture of the cartilages, without disorder in the different functions, which are more or less influenced by the spinal nerves. We have had frequent opportunities of treating chlorotics, and have been thus enabled to make the above observations; but we have never attempted the cure of any of the young patients for deviations, without giving previous attention to the state of their constitution. There are other symptoms which often suffice to awaken the solicitude of anxious mothers; these symptoms depend on attitudes.

Young persons, who lose their colour and freshness, and become thin, are often affected with deviations; the same observations are applicable to girls who grow too rapidly.

When children are deformed, are kept long

standing, and do not place their feet on the same line, one foot is constantly more forward than the other.

Young persons, who are becoming deformed, generally throw the arm corresponding to the deformity behind the chair.

One shoulder higher than the other, indicates a deviation of the spine in the same direction as the elevated shoulder.

Standing on one leg, may give rise to a lateral curvature, or, at least, lead to a suspicion of it. According to Delpech, the hand placed under the chin, to support the weight of the head, is a symptom of tubercles in the cervical vertebræ.

The constant want of support to take an attitude, indicates weakness of the muscles and ligaments of the spinal column; aversion to exercise, movement, walking, always coincides with incipient deviation.

When children do not walk straight, and always lean to one side, there is inequality of both sides of the body, and consequent deviation. All individuals whose lower limbs are unequal, have one or more curvatures of the spine.

By casting a retrospective glance on these different symptoms, we may easily understand that they are indications of the altered nervous or sanguine constitutions we have described, and to which are united the powerful

influence of attitudes; but it is from the combination of symptoms we must judge, and not from one alone. It often happens that deformity of the spine is not accompanied by any pain; at other times, by placing a plumb-line at the nucha, the deviation of the vertebræ is not distinctly seen, because the apophyses are covered with cellular tissue; the patient must then be made to stoop forward, and the deviation will be immediately perceived.

"If a plumb-line," says Shaw, "be suspended opposite to the middle of the back of the head, while the patient is standing firmly on both feet, and as erect as she can, it will hang nearly perpendicular to the centre of the pelvis. If we now rub the skin over the spinous processes, rather roughly, with the finger, a red mark will distinctly shew the course of the spine. By comparing this mark with the perpendicular line, we can form a correct idea of the sort of curvature which is formed. Above the point where the perpendicular line crosses the red mark, there will probably be a curve to the right side, while below it, there will be one to the left.

This friction on the spine may, perhaps, not be very agreeable to the patient, but it is the most accurate way of shewing the curve, and is better than marking the skin with ink or rouge. It is also of advantage, in enabling us to discover whether there be any undue tenderness in the different parts of the spine.

normal state; and deviations ever become worse, if due care be not taken to arrest their progress; they cause disorder in the internal functions, the lungs, the heart, the stomach; while regularity of these organs are necessary to the preservation of life.

Much has been said of curvatures, which are called temporary, and we have seen many in our own practice. An interesting girl, of eighteen, was perfectly straight, a fortnight after having advice, but again suddenly became crooked; the rectitude had returned without any known cause, and again disappeared. M. Bouvier very justly observed, that a number of attitudes lead to deviations, which are never temporary but with the weak and lymphatic, whose bones give way to different attitudes; and we have observed that even when the vertebral column appeared right, the pains in the heart, or near the liver, still existed. All that can strengthen and improve the constitution has, in similar cases, the happiest results.

CHAP. X.

Of the various Deviations of the Spine.

We have already shewn that deviations of the spine are due to the state of the constitution, or to habitual attitudes. We do not now intend to speak of caries of the vertebræ, nor of fractures, nor sprains; these subjects are rather in the province of surgery, and we shall treat of them in a work specially dedicated to scientific men; but at present we confine our attention to the deviations of the spinal column, which commence as slight curvatures, and through neglect become deformities. The most common deviations are lateral, that is, to the right or left: but as the spinal column is composed of twenty-four moveable pieces, deviations are seldom simple, but mostly composed; in the majority of cases, deviations of the spinal column are triple. "There are," says Bichat, "lateral curvatures as bad as anterior curvatures, and they offer a remarkable phenomenon; viz., that while there exists one in a given direction to one region, the other regions have inverse curvatures. Suppose, for instance, that the cervical portion of the spine be forced to the right, in order to maintain the centre of gravity, the dorsal region bends to the left, and the lumbar region to the right; so

that the trunk soon feels the vicious attitude of an isolated part of the spine.

If spinal deviations are not carefully attended they become worse; the ribs are soon greatly altered. Those responding to the concavity of the lateral curve are lowered, and turned inwardly; they seem to be situated one on the other like a fan half shut; when close together they adhere one to the other; and seem, that if free, they would pass through the lungs. Thus on the side of the cavity of a great lateral deviation, there is necessarily narrowness of the chest, compression of the lungs and heart, and disorder in the respiration and circulation; so that it may justly be said, that spinal deviations when allowed to reach a high degree, change and distort the animal frame; form, as it were, a new economy, with organs and functions so modified, so altered, that there results a special life for those who have undergone so serious a revolution. It is no longer the thorax, nor lungs, nor heart, nor liver, nor vertebral canal, nor marrow, nor stomach, nor intestines, in the connexion determined by nature; it is another respiration, another circulation; it is a general revolution; so that if we did not daily witness this most remarkable transformation, and if, while this transformation was accomplished, the economy had not time gradually to adapt itself to the new conditions of

existence which are imposed, we could never understand the possibility of life with such deep alterations. Let it not be supposed that life on these conditions is free from disorder, for palpitations of the heart, oppression, coughing, imperfect digestion, thinness, stoppage of growth, paralysis of certain limbs, general weakness, and distaste for the usual occupations of life, are the inevitable results of this melancholy state.

What is applicable to lateral concavity, is equally so to anterior concavity; the muscles of the abdomen and diaphragm undergo remarkable changes; the respiration is affected; there is a commencement of asthma; and pulmonary or cerebral congestion is to be feared. Delpech very justly thought that compression of the lungs might bring on consumption when predisposition existed. The convex part of these great deviations when lateral, shew the ribs separated from each other, and evidently want the strength necessary to counterbalance the effects of the gravity and false attitudes which incline the body in a different direction; and we must here recognize the propriety of Bichat's observation when he said, that in the different deviations of the spine the muscles followed the inclination of the bones, being lengthened on the side of the convexity, and shortened and swelled on the side of the concavity: the observations on the muscles are equally applicable to the ligaments.

"The lateral deviation of the spine," says

Duval, "should be considered at two different periods of life; the first septennial, which comprises the first and second dentition; and from that age to the time of puberty" Lymphatic temperament predominates in weak and sickly children with a nervous or scrofulous diathesis; whilst first dentition is always difficult and complicated by convulsions. At other times reaction takes place on the digestive canal, on the lymphatic glands, the ligaments, bones, and generally on all the tissues which protect or strengthen the articulations or joints.

In the second period, the weakest have a temperament more lymphatic than sanguine, combined with great susceptibility of the digestive organs and brain.

The progress of growth is then more marked in the osseous system than in other parts, particularly towards the age of fourteen or fifteen.

During the first seven years the lateral deviation is as frequent in boys as in girls, and more commonly met with among the poor inhabitants of large cities than among the rich; these deviations are due to constitutional causes, and to the influence of physical agents; but after the seventh year, lateral deviations are more usually found in girls than boys; and these deviations are mostly due to constitutional causes, and to the influence of ill-directed physical education. Several anatomists have observed, that towards the approach of puberty, the growth or develop-

ment of the spinal column causes great increase of height; and as we have observed, that when the organs are subjected to sudden growth they are weakened, so also is the spine more liable to be deviated at this period of life, either through excess of growth, disease, habits, or attitudes.

Deviations of the spine always cause an alteration in the shape of the chest. When these deviations are lateral, it may be observed that, on one side the thorax is narrow and convex, the shoulder elevated, the arm distant from the body, and the breast low.

On the opposite side the anterior part of the chest is flattened; the shoulder forward and low; the arm leans on the ribs; and the breast is high, and sometimes drawn under the arm.

This alteration in the shape of the chest should alone be a powerful motive for giving constant attention to spinal deviations; the lungs must suffer from the alteration in the shape of the thorax; and to this cause may probably be attributed the pectoral irritation sometimes mistaken for a consumptive symptom.

Lateral deviations of the spine may commence in all regions of the rachis, but arise usually in the lumbar and lower dorsal regions; the convexity is mostly directed to the left; the deviation is in the two or three first lumbar vertebræ, and in the upper dorsal, but is not always evident; and sometimes when medical advice is asked there is no deviation to be seen. After a

deviation has existed some time in the lumbar region, a second deviation takes place in an inverse direction in the dorsal region, and a third in the cervical region; and this treble deviation is complicated by torsion, formed by the unequal power of the muscles: it is most common among fashionable young ladies, wanting a sufficient degree of exercise, or who give more motion to one side of the body than to the other.

Torsion may exist without lateral deviation; but they are mostly found together. Many authors have mistaken the two states of the spinal column, torsion, and lateral deviation; yet it is important to know that they may exist separately, and that they require peculiar modification as to curative means.

Hump backs or posterior deviations are less common than lateral deviations: this deformity depends on the alteration of one or more vertebræ, or fibro-cartilaginous ligaments, and when connected with one of the morbid diathesis we have described, admits of much less hope of cure than lateral deviations in healthy subjects, occasioned by bad habits and ill-directed education. Anterior deviations are very rare, and found only in rachitic subjects.

CHAP. XI.

On Orthopedia; or means employed to prevent or cure spinal deviations.

It has been unjustly said, that nature tended to its own re-establishment and regular conformation. Rousseau's imitators have asserted, that a crooked plant, if left to itself, grew straight, and thought this observation was equally applicable to the human body. Unfortunately, Rousseau's statement will not suffice to establish an opinion daily contradicted by facts and long experience. There is no example of spinal deviations cured by the mere efforts of nature, but there are on the contrary, many cases, which prove that if the assistance of art be not sought before growth has ceased, spinal deviations, when they do not become worse, remain stationary; cure is out of the question. Among the few affections cured by the sole efforts of nature, scrofula, rachitism, constitutional or acquired deformities must never be numbered. In the case of a fractured arm, if the assistance of art be not sought to set the parts, keep them in their right place, and to prevent inflammation, it will soon be evident whether nature unassisted tends to its re-establishment; and more particularly, whether it tends to regularity of shape. "Very different from numerous

other affections," says Lachaise, "curvatures of the spine, of whatever nature, seldom have a tendency to return to the normal state. New causes on the contrary, are daily added to the primitive ones, and increase the extent of the curvature."

The first man formed by the hands of God was undoubtedly perfect, but as his descendants increased and multiplied, all the deleterious consequences we have noticed, more or less altered the primitive constitution. The existence of deformities may be considered nearly as ancient as the human species.

The writings of Hippocrates, Celsus, Galen, Oribaze, of Paul of Egina, Albucasis d'Avicennes, contain various indications as to the treatment of deformities. Ambroise Paré, Andry, and Ludwig, sought to leave some useful rules on the art of curing deformities of the osseous system; but it was only towards the end of the latter century that Pott, Vicdazyr, Portal, Paletta, and Scarpa, endeavoured to call attention to deformities of the human body. In 1822 the Medical Society of London selected as subject for the Hunterian prize, "*To determine the utility of mechanical means in the treatment of deformities of the spine.*" This gave rise to some excellent works, which brought this scientific subject on a level with the highest surgical questions. Shaw, Bamfield, and Sir Charles Bell, in England; Dupuytren, Delpech, and Pravaz, in France; Wentzel and Sterderich,

in Germany, gave to this treatment and to the cure of deformities a brilliancy hitherto unknown; and since then this important part of the art of curing could no longer be the province of the mechanician or the ignorant.

In 1830, the Royal Academy of Sciences in Paris imitated the London Medical Society, and a prize was to be awarded for the best treatise on the following question: "*To determine by a series of facts and authentic observations, the advantages and disadvantages of the mechanical or gymnastic means applied to deformities of the osseous system.*" So that both in France and England the learned sought to ascertain which was the best system; and thanks to these investigations, the science of deformity or orthopedia made rapid progress; and the enlightened public can fortunately be no longer imposed on by ignorant persons, professing to make the spine erect: scientific knowledge is now necessary to obtain public confidence. It is not sufficient to know the names of muscles and bones, but a deep knowledge of anatomy, physiology, or pathology, is requisite. No mechanician or drilling master can treat bodily deformity with success. The art of preventing and curing deviations forms the essential part of a good education; it is much more important that a child should be healthy, than that he should learn a dead language; and it is more important for girls to be straight, to have the chest fully expanded, than

to be brilliant performers on the harp or pianoforte. Deformities of the osseous system should be early corrected; in the interest of society it is at least necessary to take as much pains with physical as with intellectual education. But hitherto we have nowhere met with the rules of a good physical education; many authors have alluded to them, but no concise plan has yet been laid down.

Orthopedia, or the science which treats of the means of preventing or correcting deformities of the body, can only be understood by the enlightened members of the profession. Childhood must have been observed,—the influence of growth, its course, its irregularity, must be understood, to account for the numerous deviations from the normal state; the greater the advance in this study, the more serions and complicated will it be found, and above all, worthy of the attention of the physician, the philosophic legislator, and the parent. But among the numerous systems brought before the public, how is the best to be distinguished? The choice is by no means easy, for all systems cannot be excluded; as in some cases mechanical means are requisite, in other cases their use would prove injurious; in some cases exercises, in others repose; then again, a judicious medium between repose and exercise may do good; and finally, the state of the constitution may have given rise to the deviation: if so, the general health demands

enlightened care, and what system can then suffice?

As we write for parents, our object is to be clearly understood: nearly all the means employed in the treatment of physical education may be reduced to two, extension and pression, used separately or in combination. Gymnastics are employed alone or as auxiliaries to the different apparatus, and may be said to represent both extension and pression. Orthopedia may therefore be divided into three parts, extension, pression, and gymnastic.

Extension.

Let us suppose, a child has to straighten a stick, which is bent, and flexible, what plan will he pursue? Taking hold of one extremity in the right hand, and the other in the left, he will lean the convex part against his knees, and draw the two ends of the stick towards him. This idea is the first that presents itself as a means of making a curved line straight; but were the child told to straighten the stick by only pulling its two ends, he would not think it possible, as it would require an effort beyond his strength. Yet the child's first plan did not occur to orthopedists; and as though man were doomed to pass through the labyrinth of error before he could arrive at truth, the first apparatus employed for the cure of deviations was contrary to reason, to the laws of life, and mechanical rules.

We shall not refer to M. Ranchin, of Montpellier, who employed pullies and a linen press to straighten Mad. de Montmorency; but it is well to make known the means used by Lavacher de là Feutrie in 1769, for the treatment of curvatures of the spine by extension, and his apparatus during some time enjoyed a high degree of favour. It consisted of a pair of stays, having an iron bar behind, which rose above the head, and there formed a circle; a padded band was fastened round the head and neck, and by means of this bandage the head was suspended to the iron circle, and as the bar was drawn up and down, the spine was perpendicularly stretched by means of traction acting on the band. The pressure on the lateral part of the head very justly brought this machine into disrepute. Before Lavacher, Glisson had proposed suspension for the re-establishment of spinal deviations, and this re-establishment was to take place through extension of the spine, caused by the weight of the body.

The machines of Roux, Sheldrake, and Ruisch; the crosses and collars of Bell, Ruck, and Chesher, are but modifications of the inventions of Glisson and Lavacher. Sometimes extension takes place through the weight of the body alone, the head being supported, and the body hanging; sometimes there is perpendicular traction, more or less powerful, according to the will of the orthopedist. Glisson's collars, like

all those acting on the rachis by suspension of the weight of the body, can never be advisable, and it will suffice to shew their action in order that they may be rejected. "When the child's head is passed in the collar," says Lavacher, "so that there is a bandage under the chin and under the occiput, the machine is slided gently until the child no longer touches the ground and shews symptoms of suffering; this exercise is repeated several times a day, and gradually for a longer period. At first the child can scarcely remain suspended a *minute*, and after a few months exercise ten or twelve minutes cause no complaint: these exercises are to be continued until the deformity be cured." We shall, later on, make our observations as to the pression round the neck. We very much doubt whether the phrenologists of the present day approve of pression on the head, and they may probably think that Lavacher's machine was intended to destroy all the faculties spread on the surface of the brain, at least in the direction of the band.

However this may be, vertical extension, whatever support it may have received from the efforts of so many individuals interested in its success, was soon given up, and recourse had to horizontal extension; and the treatment of spinal deviations by this method is due to Dr. Venel, a native of Switzerland. Dr. Venel employed during the day, a modification of Lavacher's machine, and at night a bed; the bedstead had two

large bars, one at the top, the other at the bottom; in the top bar were three large holes, in the bottom bar two; through these holes five straps were passed, corresponding on one side with a night cap laced on the head, and on the other side with a bandage surrounding the hips, the five straps were then attached to a barrel with a catch, and the spinal column was thus extended at will, and subjected to double traction, by the head and hips. This bed probably first gave rise to that of Wurtzbourg, introduced into Paris, in 1821, but which was already used at an establishment at Morlay, directed by M. Humbert; this machine was improved by M M. Maisonabe and Lafont.

In France, M. Bouvier, Delpech, Pravaz, and Guerin, improved the method of extension; and Messrs. Harrison and Amesbury, in England, followed the steps of the French, and Swiss, with more or less success; but the principal objections to extension have not been removed. Whether vertical or horizontal extension be employed, this extension acts on the whole of the spine; and its results must be, to weaken the ligaments which unite the vertebræ. If we admit that extension acts on the compressed part, or, in other words, on the vertebral cartilaginous ligament, by separating the vertebra from each other, not only will the compressed part be acted on, but the whole of the

spinal column. The results of extension fully correspond with the expectations formed; for young girls, who have been, during a certain time, subjected to extension, are incapable of standing alone. To avoid this result, Venel made his patients wear a collar of Lavacher's during the day; and Bouvier, and others, only allowed walking with crutches. It is impossible for the partizans of extension, to refute this objection. All extension, when traction takes place by the head and hips, necessarily weakens the spine, consequently it is dangerous. Extension never gives strength to the tissues it extends; and extension can never be suited to invalids, whose deviations have originated in constitutional or acquired weakness.

But extension does not only weaken the spinal column, which requires so much strength to support the weight of the head, and organs contained in the chest and abdomen. If the power of traction be applied to the head, or under the jaws, in the first case, convulsions, epilepsy, or idiotcy may ensue; in the second, the jaw is deformed, projects, and the cervical glands being pressed, are effused, and form abscesses, which sometimes break, and leave indelible marks on the skin.

Mr. Humber de Morlay relates, that the collar adapted for extension, sometimes occasioned convulsive movements of the muscles of the face, violent cephalalgia, and tumefaction of the scalp. The jaw of a young lady, who had undergone

treatment by extension, was so deformed, and projected so much, that it was necessary to file her teeth, because they wounded her gums. M. Humber de Morlay saw a young lady who, after wearing the collar, lost her hearing. When traction takes place under the arms, and from the hips, it is quite evident, that the whole of the spine is not extended; the weakness caused by extension will then be limited to the dorsal and lumbar vertebræ; but there is reason to fear pression under the arm, and we have already condemned it in a Medical Essay on this subject.*

Extension, by means of crutches, is certainly less dangerous, but all extension is more or less improper, and unfit to be employed in spinal deviations, because the healthy parts of the spine are affected. Besides, there are other dangers: thus, extension by horizontal beds, or vertical extension, affects, in a greater degree, the vertebræ nearer the power of traction. The spine being unequally strong, extension cannot render it equal, and consequently there is more traction and extension in one part than in another.

Our readers are prepared to understand the dangers of extension in individuals with morbid diathesis; what, in fact, can be expected from

* Letters to Sir Benjamin Brodie.—Continental and British Med. Rev., Vol. I., page 135.

extension in scrofulous and rachitic individuals? when the bones are affected by weakness of constitution, which weakness does not permit the muscles and ligaments of the spine to resist the laws of gravity: extension will only increase this weakness, and thus, do more harm than good. Extension has also other dangers; the spine alone is not extended, but by drawing on the head and hips, the vessels, and the nerves also.

Wishing to be acquainted with the effects of extension, we tried one of Mr. Bouvier's beds; extension not only acted on the spinal column, but we soon found difficulty in breathing, oppression, and dyspnea; and yet extension had not been carried so far as is usual in the early stages of deviations. Similar effects were experienced by another person who made the same trial.

The partizans of extension understood how great was the objection to weakening the spinal column, in order to separate one or two cartilages, and attempted to improve their treatment, either by employing pressure, at the same time as extension, or by using jointed beds. It was too evident, that extension which condemned young girls to repose, and complete immobility, and had no other virtue than to distend, could not operate a perfect cure; and they endeavoured to combine extension with exercise.

Drs. Pravaz and Guerin caused their apparatus to be constructed on a system intended to

confine extension to the affected parts of the spine, as well as simultaneously to combine exercise of the muscles of the spine, with extension, so as not to leave the body in continual repose. We shall not here discuss the difficulty, or impossibility, of confining extension to one part, but shall merely remark, how much the partisans of extension must have been struck by the objections made to their system, since they endeavoured to confine it to one part, and to combine with it the exercise of the muscles of the spine; but oscillatory machines on which young girls are bound and stretched, although said to admit of exercise, did not yet suffice to counterbalance the evil effects of extension.

M. Pravaz and Guerin, following the steps of Delpech, wisely employed either general or special gymnastics: with such a combination of means, can it be said what part extension has in effecting a cure?

Delpech, Humbert de Morlay, and others, have combined pression, extension, and gymnastic. We are led to think that pression, combined with extension, may more easily confine the power to any given point, than extension on jointed beds.

If we be now asked, whether we believe that extension straightens the spine, we shall reply, that extension may straighten the spine, as it would iron bars; and if we be further asked, whether it be the best method of treating deviations, we shall reply in the negative. In fact,

whatever efforts may have been made to confine extension to any given part, it always acts on the vertebræ and ligaments, which are in their normal state; and the partizans of extension were so convinced of this fact, that they called exercise to their assistance, to strengthen the parts weakened by extension.

The inevitable effects of extension being to increase the flexibility of the spine, orthopedists have employed whatever could diminish, if not annul this defect. Gymnastics, baths, tonics, and aromatics, shower baths, frictions, champooing, tonics taken internally, steel, mineral waters, bitters, &c.

A young person with a deviation, having undergone these different treatments, but a very trifling degree of merit may be granted to extension, even if it be not ascertained that weakening the whole spine is an evil greater than the original deviation. Our readers will perceive, that in this exposition we have no other object than to throw light on a question which is of so much importance; and it is to avoid the reproach of interested motives, that we have purposely abstained from citing the establishments in or near London, where extension is employed with more or less injurious modifications, capable of misleading those persons unacquainted with this part of science.

Whether extension be vertical, or horizontal, we cannot terminate the chapter without giving

our opinion on its danger. In both systems extension takes place by the aid of collars, or helmets, which draw the head either vertically, or horizontally. Admitting even that the collars are so arranged, as to prevent the pression causing pain, pression nevertheless exists, redness of the face, brightness of the eyes, cephalalgia, sufficiently shew that the circulation is confined.

Extension acting principally on the cervical vertebræ, which have less resistance than any other part of the spine, and of which the ligaments are not protected by a large portion of muscles, or by the articulations of the ribs—as the lumbar and dorsal vertebræ; this extension, we repeat, will not only relax the cervical ligaments, but distend the corresponding points of the spinal chord, which act so great a part in the economy. Is it then surprising to see young girls, who have undergone extension, die of consumption, when they leave off the apparatus?

Oxigenation of the blood depends as much on the vague nerves as on the purity of the air; and we are disposed to believe that girls, during extension become pale and chlorotic, owing to the pression of the vague nerves, which has so great an influence on the lungs and respiratory functions. Extension, acting on all the cervical vertebræ, is dangerous, and children have died suddenly, when held up by the head; it is thus, indeed, that some domestic animals are killed.

Extension is still more dangerous, when under the direction of men, strangers to science, who fancy they can draw the spinal column in any direction, as if it were an inert body. To men of this description must be attributed the misfortunes caused by extension: it was in an establishment directed by an ignorant man, that a beautiful young girl was found dead, stretched on the apparatus on which extension had taken place.

On Pression.

The supposition we have made, of a child straightening a bent stick, by placing the convexity against his knee, whilst he drew the extremities towards him, represents one of the latest steps in orthopedia. But previously to reaching this simple idea, how many various means have been employed!—direct pression on the deformed parts, which were considered the most important, because they were more prominent, —thus shields, and pads, and screws, have been employed to cure a deformity; and these various attempts were made without any efficacious result, the effect being acted on, not the cause. We have already observed, that in lateral deviations, when one shoulder was more elevated and prominent than the other, it was not by pushing against the shoulder that equilibrium

could be restored, but by acting on the spinal column.

Nearly all the means of pression have been employed, combined with extension, but only as a supplement to the first. Humbert de Morlay gave a great degree of importance to his *dehossoirs* and *repoussoirs;* the orthopedists of Paris did not attach less to them—with this difference, that pression was made in different ways. It was by means of pression that they attempted to confine the action of extension to any given part of the spine.

Pression cannot be exercised in all the convex points of the curves of the spine, unless these points are seen externally, and that they are accessible to mechanical agents. Delpech has shewn that the convex side of an inflexion of the spine is sometimes directed forwards; but when the curve is lateral good effects may result.

Pression seldom acts on the spine, but mostly on the ribs which retain sufficient solidity to bear a lateral impulsion of a certain degree of strength, without injuring the organs of the thorax; sometimes, however, the mobility of the ribs will not admit of this method. Delpech employed pression to operate a version of the vertebræ in an inverse direction to the deformity, and to spare the ligaments an excess of distension, which would result from parallel tension of the axis of the spine, had it been necessary to obtain all

the same means. In order that pression ting on the ribs, should weigh on them rather an on the articulations and soft parts, Delpech ade use of an elastic apparatus.

It is worthy of notice that this learned surgeon l ways employed elastic machines, either for ex-ension or pression, so much did he fear the bsolute power of ill-directed force employed by rthopedists.

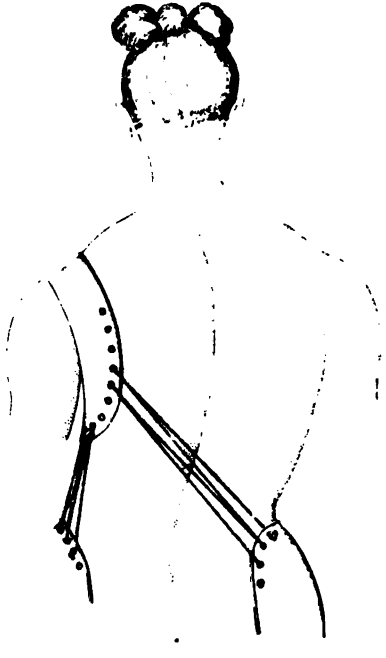
After Delpech, some enlightened surgeons gave ıp extension, and Mayor, of Lausanne, applied to the treatment of deformities the method adopted by the child to straighten his bow. Already in England, had Shaw, Bamfield, and some other surgeons, countenanced pression; and Shaw, in his reclining plane, and Bamfield, in his treatise, pointed it out as useful, but neither the one nor the other had succeeded in giving a complete treatment. Shaw's inclined plane did not suffice, and the pression and extension recommended by Bamfield, were still too little supported by facts to be received without control.

Pression combined with extension was nevertheless much more followed than any other system, but experience having shewn that extension and pression would not suffice, orthopedists endeavoured to add exercise. Thus there were apparatus, which united extension, pression, and gymnastics: these complicated apparatus are mostly in the province of sigmoid extension, and used by M. Guerin. To Mathias

Mayor, of Lausanne, belongs the
proving that pression could be appli
extension; he was the first to imitate
we have alluded to.

As we leave the combined systems of
and extension, the new apparatus beco
simple. Whilst Mathias Mayor, in Switzer
vised pression, an orthopedist of Angers
forward the reclining method, which also
by pression without extension; the simpli
the process led many to doubt its efficac
ticularly those who were interested in p
down any new system; but all attacks p
vain, and M. Hossard very justly rea
benefit of his labours and his discovery.
orthopedists, unacquainted with the progr
science on the continent, were making ex
ments in London, and the *Patent Spinal S*
proved that much pains were taken to obt
England what was easily to be had ab
The patent spinal support is but part of
system of treatment by extension and press
and M. Amesbury's apparatus, notwithstan
its many complications, is far inferior to
Hossard's belt. There yet remains a system, t
made known by us in this country; we refer
the funicularis system, which may be employ
as an auxiliary in some particular cases.*

* Continental and British Medical Review, July, 1837, an
May, 1838.



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ORTHOPAEDIC [illegible]

From what precedes, it results that, pression employed simultaneously with extension, does not annul the objection made to the latter, of distending the healthy ligaments, and weakening the whole spinal column. We admit that the action of pression diminishes the force required to produce extension, and consequently diminishes the danger. We also consider it as a happy occurrence to unite gymnastics to orthopedic apparatus; but in landing the idea suggested by experience, of counteracting the debility caused by machines, we do not believe in the possibility of obtaining wonderful results: the association of gymnastic to machines for extension is but a deception,—a species of fiction, calculated to mislead the public to a belief, that machines for extension or pression do not confine the movements.

In fact, in beds for extension and pression, to whatever establishment they may belong,—what movements are possible, when the head and hips are drawn in a contrary direction, and the thorax and spinal column are pushed and pressed in a different manner? A young girl, confined to an orthopedic bed, can only move her hands or feet. We have established as a principle that, in gymnastic exercises young persons should have as much liberty as possible, and no stays are worn during these exercises. Can the reader conceive it possible to have free movement when

the head is drawn up, the hips downward, and the trunk confined by straps? Simple pression without extension has real advantages, and may be employed without subjecting the young invalid to immobility or traction, and has none of the dangers of extension. When we talk of free pression, we allude to that which may take place by means of belts with one or two supporters. Of all machines, the most simple, and that which best answers the desired purpose, is certainly Hossard's belt; it is this very simple and not expensive apparatus, modified according to circumstances, and to the age and strength of the patient, that in many cases we give the preference.

Hossard's belt, used in Paris by M. Tavernier, and by ourselves alone in London, is certainly the most decided progress in the treatment of spinal deviations, and we feel it incumbent on us to make it known to our readers. We shall leave M. Tavernier to describe the apparatus and its action. "The apparatus is composed of four pieces: 1st, A large leather belt; 2nd, An inflexible steel busk; 3rd, One or two leather straps; 4th, An under strap; 5th, In some cases a supporter. The belt is in hard leather, well padded, and lined with soft chamois leather; it is four or five inches wide, and its length varies according to the size of the patient. It is fixed on with buckles and straps.

The part of the belt weighing on the sacrum is

a piece of steel, called *cadran à cremaillière*, formed of, 1st, A plate rivetted to the belt; 2nd, A segment of a circle fixed on the plate, rivetted at the two extremities, free in the rest of the extent, so as to admit the busk; on the upper part are four or five notches; 3rd, A pivot rivetted to the centre of the plate, in which to fix the busk. On the right side of the sash, in the corresponding part of the armpit, is a steel socket, to fasten a band to support the shoulder.

The *busk or lever* is a steel bar, about an inch wide, and, when fastened in its place, the upper extremity passes the posterior angle of the shoulder; at the lower extremity of this busk is a slanted opening to receive the pivot, and keep the given direction; there are several other pivots, to which are attached the large leather strap.

This strap, that we shall call pectoral, to distinguish it from the one termed lumbar, has four ends, the two lower ones are received in two buckles attached to the anterior of the belt, and to the right the two upper ends are fastened to the busk by eyelet holes. The weight of the large belt falls on the ribs, and which corresponds to the convexity of the rachis.

The *under strap*, which is a most important piece, as it is destined to bear nearly all the effort of straightening the spine; it is three inches wide, doubled in chamois leather, and well padded; the straps fix it to the belt, before and behind with two buckles.

In some cases, there is another strap, called lumbar, intended to act on the false ribs, to remedy certain varieties of lower curves; it is fastened to the middle part of the busk, which corresponds with the lumbar region; this strap is fixed in a buckle, situated in the anterior part of the band, on the right side, and on the left of the last knobs on the busk.

The *guard* is fixed in the socket, and is destined to support the lower shoulder, and to facilitate the movement of the upper part of the trunk, which is necessary to straighten the dorsal curve, in cases of want of energy of the muscles, or where the too great rigidity of the articulation of the vertebræ prevents the movement.

For this piece a simple strap may be substituted; it is placed under the arm, and attached to the busk.

Though this apparatus is but little complicated, the mode of using it is not so simple as it may appear, because deviations vary greatly, and a little more or less deviation of the trunk, and a slight degree of obliquity of the large belt produce very different effects.

It is natural to enquire how a method so efficacious, so simple, and so conveniently applied, has not cured thousands of deviations since the time of Venel, who is said to have invented the lever, of which M. Hossard has made use? The fact is, that while Venel applied the lever to the treatment of club feet, he was no more aware

of the effects of the inclining belt, than Archimedes, who knew the lever, and calculated its power, was aware of Venel's *sabot.*

Since Delpech used the inclining method, M. Hossard has also applied it; but having found by experience, that young girls used to the reclining apparatus, required some means to maintain the regular state obtained by this method, he invented a *Corset Contentif;* in some other cases he found it necessary to employ a riband, to keep up the attention of the young girl, and preserve her from bad attitudes—this first idea gave rise to the funicular system, which we have elsewhere described.*

Medical and Orthopedic Gymnastics.

MEDICAL gymnastic, which comprises the means of remedying certain infirmities of the body, and particularly deviations of the spine, has been put in practice lately with more success than was anticipated, and has reached a high degree of perfection.

The learned Delpech was the first to point out its advantages, and in his excellent work on Deformities, says, "that he should have given up the hope of curing certain deviations, but for the assistance of gymnastics."

Gymnastics, applied to the treatment of devia-

* Continental and British Medical Review—May 1838.

tions, are meant to remove the muscular weakness which sometimes causes deformities, to counterbalance the evil effects of inaction on mechanical beds, to consolidate the cure, and strengthen the parts that have been straightened.

Some medical men have thought to cure spinal deformities by gymnastics alone, and we think that slight deviations might be thus removed; but we think with all orthopedists, that gymnastics alone would not suffice to cure composed deviations, and lateral incurvations of a certain extent. But in establishments, where beds for extension are employed, gymnastic is no longer an unimportant accessary; it is positively necessary to counterbalance, by exercise, the inaction of the body stretched on mechanical beds, and to give to the debilitated muscles and tissues, a degree of strength which cannot be obtained in any other way.

It is seldom that muscular weakness is general, unless there be so great a debility of constitution, that all gymnastics cannot be employed. But in most deviations or deformities, muscular weakness is but partial or relative:—thus, one side of the body is less developed, because less exercised; the muscles of the neck, which have been weakened on one side, by disease, then the muscles, the arms, or part of the spinal column; in all cases, these muscles, when partially weakened, require exercise: when there is

no positive contra-indication, special gymnastic must be applied, and the muscles left in repose on the strong side. Orthopedic gymnastic consists in applying exercises suited to the degree of weakness, or state of the subject. We cannot review all the means that orthopedia borrows from gymnastics, yet shall study their action on different parts of the body.

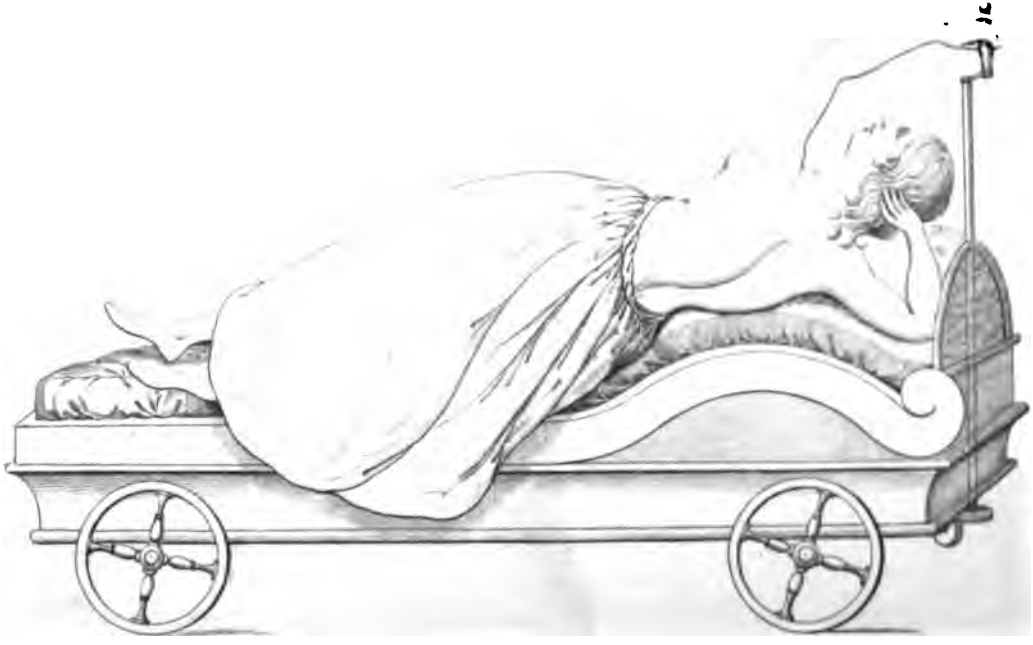
Delpech made a distinction between pure dynamic exercises, and exercises for equilibrium; by the first, he endeavoured to preserve the vertebræ from the pressure of the weight of the superior parts; by the second, he sought the proper means to prevent any muscle being deprived of movement. Without exactly following this division, it may guide us in the enumeration of gymnastic means.

The first exercises are intended to exercise the superior limbs by suspension, so that the weight of the body falls below, and thus causes the column to be straight. Among this number, are exercises on the straight ladder, then on a spiral ladder, then on rope ladders, and then on ladders placed horizontally, and triangles; but these exercises, that nearly all orthopedists have pointed out as desirable, and that we advise to develop the chest, are nearly all contra-indicated in the anormal and irregular development of the body, as they exercise both sides in an equal degree; so that all the muscles are strengthened,

without the deformity being cured. The phy cian presiding over these exercises, modifi them according to the individualities. Thus, tl young patients must go up the spiral ladder c one side, the horizontal ones slightly incline the triangle not straight, one of its extremitie should be more elevated than the other; withou the strictest attention on the part of the medica attendant, special gymnastic is but a word.

In these exercises, extension by the weight o the body is always combined with traction of the muscles, the aid both of hands and feet are required; as strength is gained, the weight of the body is supported by the hands alone. These exercises should be avoided when the patient is weak or scrofulous, for the extension of the ligaments uniting the vertebræ could but increase the general weakness. All exercises for suspension, should only be followed when the patient has acquired a certain degree of strength, by preparatory exercises.

In a work that we have endeavoured to render concise, we cannot give a minute detail of all the varied exercises we have seen in the gymnasia of La Muette, Colonel Amoros, Madame Masson, and other institutions of Paris, as well as the too few establishments in and near London. We cannot even here enter into an explanation of our own ideas: suffice it to say, that orthopedic gymnastic may cure slight devia-



UNDULATED COUCH FOR SPINAL DEVIATION.

London. Published by Henry Kent Causton, Fleetwin Lane, Jan. 1848

tions; that they are indispensable to counteract the effects of extension and repose; and without their assistance, little hope can be entertained of strengthening the organs, and making their re-establishment permanent Among the apparatus, comprised in a gymnasia, is the undulated or progressive couch, combining all the advantages of pressure and gymnastics, which may principally suit lymphatic girls, with whom extension is to be avoided.

The undulating couch is on the same plan as the inclined plane, invented by Shaw, and improved by Dr. Pravas. The undulated couch solves the problem of the child straightening a bow. The convexity of the couch represents the knee, the head and the pelvis are the two extremities of the curved spine, and tend from their own weight and want of support, to reach the straight line. The muscles on the left side, the trapezius, the large dorsal, the small dorsal, the rhomboid, the spinal muscles, and all the muscles of the thoracic region, are in action to straighten the curve, and have the double advantage of developing the chest, and strengthening the muscles. In all spinal deviations where the bones and cartilages are not affected by scrofula, caries, and ramollissement, the spinal column has only given way to continual traction of muscles rendered strong by exercise—whether these muscles be directly united to the spine, or whether they take rise in a part which follows its

movements. The advantages of the undulated plane, are very great, as it admits of free motion; the exercise may be taken at all hours, either in a drawing room, or in a garden.

As the spinal column cannot be suddenly straightened, the weight of the body alone on the convexity of the spine, would not suffice,—the pressure would be too slight; but the muscular exercise on the weak side, adds to the advantages of this plan; and a glance at the undulated couch suffices to shew how well calculated it is to arrest the progress of a spinal deviation in its early stage, and to aid the cure of those deviations at a more advanced period.

If we seek to draw conclusions from all that has been written on extension, pression, and gymnastic, we shall say, that extension alone is almost always dangerous; that extension and pression combined, may straigthen certain lateral curvatures of the spine; but the strongest partizans of this system, admit that the cures thus effected could not last, without the aid of gymnastics.

Extension, pression, and gymnastics, combined, are the most complicated, without being the best method; and the reclining apparatus is undoubtedly, *in most cases*, the best, as it leaves the young invalid at liberty to derive all the advantages of air and exercise, and does not prevent the pursuit of the usual occupations. The funicular system may be applied as an useful

accessary. Well directed gymnastic is, in all cases, prolific in good results.

The preceding pages were intended to make known the dangers of some systems now in vogue: to point out a rock, is to enable the pilot to avoid it, and may prevent shipwreck.

Were muscular debility general, the gymnastic exercises already mentioned, might be resorted to; but great judgment is requisite to discriminate between debility of the muscles and weakness of the bones.

Muscular debility is generally partial; one side of the body has been less exercised, less developed than the other; an inequality exists either in the muscles of the neck, of the side, of the eye, of the arms, or the legs; at other times, it is in the spinal muscles, or those supporting the posterior-lateral equilibrium of the vertebral column. When these muscles are partially weakened, and nothing prevents exercise, they must be exercised, while the other muscles are left in a state of repose. The problem to be solved, consists in applying to weak muscles gymnastic means, appropriated to the degree of weakness. It is easy to understand, that these gymnastic means cannot be general, and that exercises suited for weak fingers are not applicable to the weakness of the muscles of the neck.

We shall proceed to study the various methods applicable to the different parts of the body, and previously to enumerating them, beg to state

that we are far from considering gymnastics as a certain means of cure, particularly if no other remedy be sought. Muscular debility requires, besides gymnastic exercises, internal tonics, or strengthening diet, good air, frictions, shampooing, baths, and other hygiènic agents, which an able practitioner can alone prescribe; and we, therefore, condemn the implicit confidence placed in common drilling masters.

Parents, in England more than in any other country, are seldom satisfied with being mere observers; there are few mothers, or nurses, who do not think themselves as well informed as their physicans, and who do not seek to employ means of cure recommended, without judgment, by some acquaintance or other.

For our part, we think the attempts of both almost always dangerous; and for the benefit of children, we are willing to point out to parents some cases of deformity, caused by weakness of the muscles, of the neck, chest, arms, and legs, for the cure of which inefficient means have been employed.

CHAP. XII.

Deformities of the Neck.

For any deviation of the neck not resulting from paralysis, alteration in the vertebræ or ligaments, gymnastics are extremely beneficial, and invariably successful if well directed.

It is a general rule, that the weakest muscles should be the most exercised; when, therefore, weakness of the muscles causes the head to bend, the apparatus invented by Shaw should be used, and it produces so little discomfort to the patient, that she can, while wearing it, write, draw, or practise the piano-forte.

Numerous methods have been advised to keep the head erect; among others, a small apparatus in whalebone, so constructed as to touch the reclining part, and by causing pain, compel children to hold up their heads: we by no means recommend this contrivance.

An iron cross, and collars for extension, already mentioned, are sometimes used; but may rather be considered orthopedic than gymnastic, and should only be employed occasionally. It is far more desirable to place something on the head, a small basket, or a light vase, for instance, which will fall as soon as the equilibrium is destroyed. This plan is well adapted for children, as it is the means of procuring them amusement, while it

tends to improve the figure: in the summer there could be no objection to putting a cup of water on the head; at other times a ball, or indeed anything with a small basis. To render this exercise a remedial means, it is of course understood, that the toy is to be placed on the immediate centre of the head, so as to necessitate an erect posture to retain the equilibrium; otherwise it might contribute to a deviation it was employed to relieve.

A ribbon tied round the head, in order to draw it in different directions, has also been advised; but does not always answer the desired purpose.

Among the various works written on this subject, we find Andry's observations the most judicious. One example, given in the second volume of his Orthopedy, we beg to transcribe:—"A child of ten years old had a wry neck; this deformity was first noticed when she was seven years of age, and continued to increase: no cause was assigned for it; and she was suddenly cured in the following manner. The child was taken by her mother to see some fireworks; the house was so situated that they were only to be seen from one side, which was the contrary one to which the child could turn her head; but she was so anxious to know what passed, that she made considerable exertion to turn her head round, and although she suffered much pain, yet her curiosity was so great that she persisted in the

effort, and before the fireworks were over she could turn her head either to the right or left."

Attentive and judicious parents will always find means to remedy evils of the kind, which, if left to increase, become deformities; but unfortunately the defects we allude to are generally encouraged; children with wry necks, for instance, are allowed to turn their heads in the same direction, and in order to their momentary ease, parents sit near them on the side they are accustomed to turn; whereas, by sitting on the other side, it would be necessary for the young patient to make some effort, which however slight, would eventually contribute to recovery, as by repetition the muscles would be exercised. Andry very justly says, that the internal workings of nature are at last displayed, as may be observed in training plants, and success is chiefly attributable to *perseverance and constant attention.*

If the whole work of Andry had been composed in a similar spirit, we should have had nothing to add to these observations, and our present undertaking would have been useless; but there are so many long and uninteresting details, and such a number of errors to be overlooked, before any proof of the judgment displayed in the last observation can be discovered, that the labour of perusal is scarcely repaid by the remarks we have been enabled to quote.

When wry necks are produced by other causes, such as paralysis, injury of the vertebræ,—by the scar of a wound contracting the muscles,—by tuberculous disease, or softening of the cartilages, it is easy to understand that the slight means just recommended will not suffice to remedy cases of so serious a nature; indeed, most of them may be considered incurable.

Andry, and several authors who have servilely imitated him, consider goitres as deformities; we cannot follow their example without entering too deeply in pathology. Without copying Andry, whose opinions on goitre and its treatment are no longer in vogue—without prejudice to the question respecting the cause of goitre, we must say, that in countries where this deformity is common, women who have worn cravats have been less subjected to it. This observation was made in Guatimala, where this deformity affected all classes of society; and in Europe, when females embrace a monastic life, and wear dresses that prevent the action of the air having any effect on the neck, goitres are very rare. As it is easy to wear a cravat, we relate these circumstances, without however, giving any great degree of credence to them. Iodine, employed internally and externally, appears more efficacious; and we do not hesitate having recourse to this remedy, inasmuch as affections of the neck are often connected with strumous diathesis, for which iodine is successfully employed.

The stoop common to children is mostly caused by their being made to write or draw too long, or allowed to sit habitually in arm chairs; both tables and chairs, we repeat, should be adapted to children's age and height.

When chronic diseases of the neck, known under the name of torticollis, or of wry neck, cannot be cured by the means we have enumerated, they are treated successfully, by the section of part of the sterno-cleido-mastoid muscle; but this again is in the province of surgery, and we mention it only to acquaint parents with the existence of a practice which may be had recourse to, when all other means have failed.

Inequality of the Shoulders.

It has been generally thought, and incessantly repeated, that the difference between the two shoulders depended on the irregularity of muscular exercise, and the habit of using the right hand more than the left.

Mr. Duffin says, "that among the male aborigines of London, the practice of giving the wall by the left, and taking it by the right shoulder, which originated in their narrow crowded streets, something less than a hundred years ago, has given an advance to the right shoulder, and an obliquity to the trunk, by which they are easily distinguished amongst other men, and which

vain new comers often awkwardly imitate, from an idea of these postures being fashionable."*

We by no means coincide with this author; indeed to us, his opinion seems inadmissible.

The privilege of the right hand involves a deep question; we need only observe, that it would be difficult for both hands to have an equal degree of power, while so many arts are exclusively cultivated by the right hand. This circumstance alone suffices to establish a difference, though some authors will not admit the fact: it is commonly supposed that the muscles of the wrist and fingers are alone in action, while writing; but those who are accustomed to write much, feel more pain in the muscles of the right shoulder than in the arm and hand.

Though the frequent use of the right hand contributes powerfully to the inequality of the shoulders, yet this habit alone will not produce deformity: new-born children have sometimes one shoulder projecting more than the other.

However this may be, where inequality of the two shoulders exists, and there is muscular weakness on one side, the weak parts must be exercised, the stronger ones kept in repose; and not as in general gymnastics, in which it is considered necessary to strengthen and develop organs that have similar powers.

The series of exercises laid down in gymnastics may be had recourse to, but for the weaker

* Duffin. p. 60.

arm only, whether right or left. When there is not only inequality of the shoulders, but also a deviation, the patient should endeavour to lean more on the opposite foot, or a small weight might be placed on the inclining shoulder, provided the evil does not arise from softening of the bones. Carrying ladders, resting on arm chairs, made with one arm higher than the other; walking with a short stick, are means that have been often advised; but the most efficacious remedies appear to be, the circular motion of the weak arm, gradual weights, gymnastic exercises, and swinging a certain weight to and fro. All these measures must, of course, be judiciously directed.

"A change," says Shaw, "often takes place in the shape of the chest, which, though quite different from that produced by the simple lateral distortion of the spine, is almost as great a deformity; in its first stage, the ribs are bent forward, so as to have some resemblance to the back of a spoon; by the bending forward of the spine, a change is produced in the figure of each rib; in the natural state of the chest, the part of the rib between its head and angle is nearly straight.

"The first effect produced by this change, in the form of the spine and ribs, is to make the shoulders appear round, and full, and the lower angles of the scapula to project, which latter effect is caused by the falling forward of the scapulæ; for they are not only supported by the

upper ribs, but are dragged forward by the clavicles being carried in the same direction as the sternum; such a degree of distortion is more common in lads of sixteen than in young ladies."

We must be allowed to relate an observation made by the celebrated and unfortunate Delpech, who was so early, and tragically snatched from science:—

"A young lady, of a noble family, twelve years old, being an only child, was brought up by her mother luxuriously and effeminately. This excess of maternal fondness was fraught with the most serious consequences; indeed, her physical education was completely misunderstood, and she was scarcely allowed to walk, lest she should suffer from fatigue.

"It naturally followed, that the muscles were weakened, the child wasted away, became pale, had a distaste for food, and her manners were awkward. A curvature of the spine became manifest, the lumbar region turned towards the right, and the dorsal region to the left; the upper part of the body was bent forward. She was attentively examined in 1827, and we found that the left side of the body was less than the right. The young lady was given up to our care, but the father, though a man of great talent, could scarcely make up his mind to allow the necessary means of cure to be undertaken, and we were compelled to confine the patient to gymnastic exercises, and vapour baths.

However, a remarkable development took place; the body strengthened, the health improved, the muscles were firmer, and the deformities, compared to what they were when a model of the body was taken, became considerably less."

When one shoulder is larger than the other, it has been advised, to place a hard cushion under the weak shoulder when the patient lies down.

The inequality of the shoulders, when carried to a great extent, causes much awkwardness; young girls walk on one side, and seem as if they could not find their equilibrium; a certain weight should be given to the weak part, in order to counterbalance the strong one; and there can be no doubt as to the advantages that must result from putting a weight on the lowest shoulder, as the fear of letting it fall, makes the child elevate the shoulder.

A young man had part of his left arm crushed by the wheel of a heavy laden waggon; amputation was considered necessary, and he submitted with great courage to the operation; the arm was taken off below the elbow. This individual was a messenger, and after his recovery, he resumed his occupation, with his wonted energy, and was not a little surprised to find he could not run quickly, the loss of his left arm had destroyed the equilibrium,—he always leant to the right, and it required considerable effort, on his part, to walk straight. Dupuytren advised a false arm, but the man preferred

carrying a heavy stick, horizontally, and leaning the greater weight to the left.

Travellers may observe maimed beggars following a carriage, and they will perceive that they have some trouble in walking in the direction of the lost limb; and that they keep the remaining arm crossed on the breast, which may be looked on as instinct, this position tending to preserve the equilibrium. The attention directed to these facts, numerous instances of them will be noticed.

A lady once mentioned to us, that she disliked walking with her pupil, who always pushed her in the road, and added, it was almost equally fatiguing to go out in a carriage with her, as she leant her whole weight on the person seated next to her. We enquired if the young lady was crooked, her governess replied in the negative. We observed, that she was probably mistaken, and recommended great attention being paid to the figure. Shortly afterwards we were called to attend this young lady, and found our suspicions verified; there was a curvature in the spine, which yielded to judicious treatment, and proper exercise.

It would be wrong to suppose, that where inequality of the shoulders exists, we recommend exercise for the weaker side, and compel the other side to *complete* inactivity. When the development of the body is unequal from muscular debility, one side of the body being more

exercised than the other, the necessity of gymnastic exercises with one hand, is quite evident; and when the weak side has gained a proper degree of strength, both hands may be exercised together, and there will then be harmony in the whole frame.

When the shoulders are round, the chest narrow, gymnastics must be adapted to the state of the individual; the figure is frequently spoiled by bad habits—crossing the arms and legs; and much harm is done by allowing children to sit on one side. Governesses should be very careful what punishment they inflict on their pupils, and guard against doing anything that may make them stoop, confine the chest, or cause the shoulders to project.

But before leaving this subject we must impress on the minds of our readers, that the elevation, or the growing out of a shoulder, is nearly always the result of a spinal deviation, and that it cannot be cured, unless the spine be brought to its normal state and rectitude—so that means ought not to be applied to the shoulders, but to the state of the spine, which is the origin of the inequality.

Of the Chest and its Development.

It must ever be remembered, that in gymnastics, whether general or special, everything must be avoided that tends to confine the chest or injure the organs of respiration and circula-

tion. There are exercises and positions which, by rounding the shoulders, contract the pectoral cavity.

The sternum, on which the ribs lean, is a bone of slow growth, and most liable to modifications; if too much weight be thrown on it, the pressure on the lungs and heart gives rise to the diseases of these organs. This pressure must necessarily occur when young persons are affected with spinal complaints, pleurisy, or consumption.

Shaw observes, that in some instances the ribs are elongated and flattened in an extraordinary manner, although the curve of the spine is *not* very great. A lateral pressure made upon the ribs, when the spine is slightly bent, will tend to throw the sternum forward, and thus give the chest not only a form resembling that of a bird, but even of a fish; indeed in Germany, this shape of the ribs is familiarly called *karpfen*, from the resemblance to the ribs of a carp.

If there be any means of prolonging life, the art consists in enlarging the chest, and giving greater development to the pulmonary organ, so that more air may be received and be better decomposed, and a larger quantity of the principles of nutrition and sensibility furnished.

When there is too much blood in a narrow chest it becomes vitiated, and may give rise to tubercles. The sanguine particle arrested in its circulation, may become the centre of a tubercle, as Vanhelmont's thorn is the centre of irrita-

tion. There must be a superabundance of blood in a narrow chest, particularly if the individual thus affected take but little exercise, as in a state of inaction the muscles require less nutritive fluid.

Alphonse Le Roy was of opinion that the development of the chest is the true standard of the length of life: to confine and arrest this development, is to shorten existence. Whenever organs admit of extension, proper exercises should be recommended in order to favour this extension; the only means, therefore, of prolonging life is to expand the chest, so that it may admit a greater quantity of air. This manner of measuring the probability of the duration of life, is well known to, and practically applied by those who traffic in human blood. After corrupting the savages of Africa, and exciting them to civil war, for the purpose of obtaining their respective prisoners,—to sell them to Europeans, claiming the title of social and civilized beings, —the slave traders whip their unhappy victims to make them run, and those blacks who reach a certain distance in a given time, and seem less out of breath, are valued at the highest price;—their chests being better formed, they are calculated to live the longest.

An examination of the movements of the thorax, has always shewn the degree of perfection or imperfection of the respiration. Laennec observes, it is a plan generally followed by

veterinary surgeons, and is rendered easy by the nakedness of the animals; the object in view being to ascertain their value, which is founded on the mode of respiration.

When the front and lateral parts of the chest are equally dilated, the respiration may be considered natural if the number of inspirations in a minute are twelve or fifteen while the individual is in a state of repose.

It may be established as a general rule, that the chest is always more or less deformed when the spinal column is curved; and this knowledge is useful in indicating that if the ribs are deviated from their normal state, it is not by the exercise of the muscles only, but by an action on the spinal column, or on the ribs, that they may be restored to their normal situation. We have in so many instances called the attention of our readers to the regular conformation of the chest and of its function, that we feel the necessity of avoiding repetition.

One of the most essential remarks as to the development of the chest and lungs, relates to the importance of vocal exercises. It is said that the dumb fall victims to consumption, because their lungs being weakened, want development, and are liable to atrophy, caused by their inability to speak.

As a preventive measure to consumption, Dr. Clarke recommends the full expansion of the chest, in the following manner: "We desire

young persons, while standing, to throw their arms and shoulders back, and when in this position, to inhale as much air as possible; to repeat this exercise at short intervals, several times in succession; when this can be done in the open air it is most desirable, a double advantage being thus obtained from the practice; some exercise of this kind should be adopted daily, by all young persons, more especially by those who are narrow chested and deformed, and should be slowly and gradually increased"*

We may add to the recommendations of Sir James Clarke, that the exercises of the triangle, of the ladder, and all those which consist in turning a handle, placed at a convenient height, horizontally, or vertically, may be of real utility, provided children be not deviated, and if narrowness of the chest be not complicated with spinal curvature, or unequal development of the two sides of the body.

Of the Hands and Arms.

ALL the exercises we have mentioned are applicable to the arms and hands, but for the latter, there are many peculiarities requiring attention. Nothing is so lady-like as a well formed hand; it is tacitly understood to be the privilege of women of fashion, and is, therefore,

* Cyclopedia of Practical Medicine.

more fully appreciated. Few painters, however great their merit, paint hands well. Mignard, when painting the queen-mother, took great pains to give due effect to her beautiful hands, on which she placed so high a value. Connoisseurs look upon the hands of the Apollo Belvidere as the chief merit of the work.

A well-made hand must be delicate, rather long, and dimpled. The hand requires a great deal of care; indeed, to keep it in full beauty, necessitates an almost continual state of idleness. In order to strengthen the hand for the piano-forte, a weight must be placed on it; great proficiency may be thus acquired, when combined with exercise. Leaden rings, of unequal weight and size, have been invented under the impression, that the little finger, being weaker, should bear a lighter weight; thus, the weakness was maintained instead of corrected; whereas, by applying the weight to the weaker part, it gradually acquires strength. To the weakness of the little finger may be attributed the inequality of execution on the piano-forte and harp; a well exercised ear quickly catches this inequality: the fingering is irregular, the little finger being weak, does not bring forth sounds equal to those proceeding from the touch of the other fingers.

A Lady, after her recovery from her confinement, seemed to have lost all her skill on the instrument, not only from want of practise

but extreme weakness of the fingers; we advised her wearing rings, made for the purpose, the heaviest being placed on the little finger; as the strength of the fingers returned, the rings were made heavier: this plan was continued during two months, and the fingers not only lost their stiffness, but acquired extraordinary agility,

Young ladies suffering from muscular debility, who have been some time recovering from an illness, and feel scarcely able to place their fingers on the notes of the piano-forte, may derive great benefit from the use of these rings.

Madame B. observing the advantages to be derived from a knowledge of the development of muscular strength, and applying this knowledge to the piano-forte, played with weights on the left hand, till it acquired an equal degree of strength with the right, then with unequal weights on both hands, and afterwards with weights precisely similar. This gymnastic of the fingers should be recommended by music masters, who are really anxious for the progress of their scholars.

The flexion and contraction of the fingers is in the domain of surgery, and may be cured by different means.

Deformities of the Inferior Limbs.

THE inferior limbs are stronger and more solid than the superior ones, yet they are more often

liable to deformities. The diathesis we have studied have great influence on the bones; the femurs are often deformed in weak children; they are curved, the knees closed together, so that the thighs appear shorter than in the normal state: this disposition appears principally after birth, during dentition, sometimes before infants walk, more often when anxious nurses put them on their feet too early. Parents must wait till their children have acquired sufficient strength to allow them to stand alone. Very often nurses or servants cause a deformity of the legs, by carrying children too near themselves, and pressing their tender limbs.

A difference exists between children, according to their station in life and their constitution. scrofulous or ricketty children are pale, their flesh is not firm, their joints are enlarged, or appear so. Curvatures sometimes exist in the bones of the thigh as well as in those of the leg; and while the former are difficult to cure, even by employing the most rational means, the latter merely require a little enlightened care.

Whatever may be the curve of the bones of the legs, there is always a weakness of the muscles, which are thin; the ligaments also are weakened, the articulations looser. When a curvature begins, it has a tendency to increase, because the muscles of one part are retracted, and the antagonist lengthened, and lose their

strength; this fact shews the advantage of early attendance.

The knees are very often deviated from their natural state; they are generally so in every deviation of the thigh, or of the leg; sometimes deviations of the knees exist alone. Children in running, feel their knees knock together, and complain of uneasiness in their limbs.

These deviations generally appear in early infancy, when children try to stand, yet are too weak to walk, or support the weight of their body. It may often be observed when weak children are put on the ground, and induced to walk, their feet are very much separated one from the other, whilst their knees are close together, as if to lend each other mutual support. This disposition is principally common to young and weak children, but is found also among the convalescent. Weakness of the joints is undoubtedly caused by bodily weakness, and local means, as well as general treatment, should be applied to cure it.

Some young ladies have the articulations of the feet and legs so loose that they walk with difficulty, and are unable to dance. In these cases gymnastic and dancing might be more injurious than useful; and parents must call for the advice of a physician rather than the attendance of a dancing-master.

After having drawn a rapid sketch of the deformities of the legs, we must now speak of

those of the feet, which are not less common, and distress the deformed the more, as they are continually exposed to the public eye.

For the different cures of the bones of the legs, which depend on the bad physical education of nurses, it is sufficient to draw the attention of parents to this subject, and to suggest preventive means.

CHAP. XIII.

Club Feet.

ONE of the finest geniuses Great Britain has produced was afflicted with a club foot, and preserved all his life a bitterness of feeling that he could not overcome.—

> " ——— Nor sought to win, —
> Though to a heart all love,—what could not love me
> In turn, because of this vile crooked clog,
> Which makes me lonely."
>
> *(Deformed Transformed.)*

This deformity is either congenital or accidental, but in both cases it is curable; the foot is turned over and rests on the ground, or any other part but the sole; it takes various shapes, and is known by different names. The ancients used the term *vari* to express deviations of the feet when they were turned inwardly, and when turned outwardly, the deviations were known by the name of *valgi;* and *pedesequini* were those whose toes alone rested on the ground; each of these species comprise several varieties, nearly always complicated by different affections.

The causes of club feet before birth are more or less hypothetic; notwithstanding the great medical authorities who have emitted their opinions on this subject, it is not in our power to prevent these deformities. There is a better knowledge

of accidental causes, and these appertain to the domain of physical education.

Contraction of the muscles, falls from a great height, sprains, luxations, sores, and burns, are the most common causes of club feet. In the majority of cases the patient takes different positions to avoid discomfort or pain,—the foot does not lay flat; when children have a weak constitution, these deviations are easily established, and habit gives to the principal part of the feet new connexions and new shapes. It may be considered as a general rule, that both children and adults, from instinct, fly from pain. It is to avoid pressure on the painful part that different attitudes are taken; and when both feet ache, we turn the feet on one side, and if obliged sometimes to walk in this manner it soon becomes a habit. The muscles on both sides of the foot are impaired,—elongated on one side, relaxed on the other; the effect is soon combined with the cause, and the deformity consolidated. Too great a degree of attention cannot be given to the position in which children place their feet, either while walking, standing, or being seated. Deformity of the feet is sometimes caused by spasmodic contractions, convulsions, or paralysis of some of the muscles. However this may be, it is of great moment to give early attention to the state of children's feet when they appear to be at all inclined to deviate from the proper position. The diathesis or predisposition we have studied,

and found to be so eminently fertile in causing vertebral deviations, are equally so in producing all deviations of the osseous system.

Accidental club foot does not shew itself suddenly; it commences by vacillation, then by an inclination, either inside or out; or by slight elevation of the heels, as in accidental equinous feet. Whether the origin of the disease depend on the primitive inequality of muscular strength, or whether it be due to a sprain, or any other accidental cause,—without apparent deviation of the foot, the child complains of fatigue after slight exercise, the articulation seems confined and painful in one or both feet, and the child cannot stand steadily; sometimes there is involuntary contraction of the muscles of the legs, swelling and pain round the tibio-tarso-articulalation. Parents unfortunately look upon these symptoms as growing pains, and remain in false security

If children wear out their shoes more on one side than the other, and have a scrofulous or rachitic predisposition, or even when they have a weak constitution, attention should be given to their mode of walking, and to any complaint of fatigue. If children are born with club feet, this deformity must be treated very early.

The feet of infants are very pliable, easily shaped by the hand, and turned in a different direction to the deformity, but never in a complete manner; as when the hand is removed the

foot immediately returns to its original position. As children advance in age the cure of distorted feet is more difficult; the muscles and ligaments acquire a degree of strength, which eventually becomes invincible.

The termination of the different distortions of the feet offers nothing remarkable in the successive changes of shape. When the general health is good, distortion of the feet does not affect it; but if the vital principle be not attacked, how many discomforts, how much pain and fatigue ensues! and when this deformity is complicated by other affections, particularly scrofula or rachitism, caries, necrosis, and amputation, may result.

If distortion of the feet be simple, and treated early, the cure is easy; the deformity not confirmed, but incipient and accidental, may be prevented; cure depends greatly on the age of the patient, and the more or less use of the legs; much exercise increases the deformity. The time after which there is no hope of cure is not easy to determine, but it is generally supposed to be the 25th year.

The preventive and curative treatment of club feet consists in bringing the osseous parts to their normal state; to re-establish the equilibrium between the action of the muscles, and to maintain the parts in their proper place, can only be affected by the aid of different mechanical apparatus, and under the direction of an able phy-

sician. Many good papers on this subject have been written by Venel, Jaccard, Scarpa, Bruchend, Stromeyer, in Germany; Duval, Bouvier, and Mellet, in Paris; Sheldrake, Shaw, in England; and parents are not justified in withholding treatment from their children, when science offers certain means of cure for deformities, which render adults incapable of following their different careers, and condemn them to a life of inactivity, sorrow, and regret.

It is generally known that the Chinese ladies take great pains to destroy the natural shape of the feet, by turning their toes down, and wearing a tight bandage round them, by which means they produce artificial club feet. It must be allowed that if in Europe the exception be not equally great, yet many ladies, by wearing tight shoes, bring on chilblains and corns, which render them incapable of walking with ease and grace.

CHAP. XIV.

On Blindness and Strabism.

France first gave to Europe the example of a disinterested philanthrophy. While in less civilized countries, the unfortunate individuals, who from birth, or through accident, were deprived of one of their senses, dragging their wretchedness and infirmity from door to door, and owing their subsistence to public charity, in France an asylum was opened to them; but an asylum alone did not suffice,—they required occupation, a useful education, which could draw them from the state of desolation, darkness, and privation, so eloquently described by Milton:—

> ——————" Thus with the year
> Seasons return: but not to me returns
> Day, or the sweet approach of eve or morn,
> Or sight of vernal bloom, or summer's rose,
> Or flocks, or herds, or human face divine;
> But cloud instead, and ever during dark
> Surrounds me, from the cheerful ways of men
> Cut off, and for the book of knowledge fair,
> Presented with a universal blank
> Of nature's works, to me expung'd and raz'd,
> And wisdom at one entrance quite shut out:"

It was, in fact, little to give shelter to the indigent blind,—it was also requisite to give them

a handicraft occupation, or talents that might enable them to provide for themselves, and by exercise and manual labour, guard them against immorality originating in idleness; combining thus bodily and mental health.

In France, the first essays for the education of the blind, were too intellectual; they were taught matter beyond their comprehension. M. Haüy gave to his pupils, by means of the touch, ideas, of which they were deprived by absence of light. He composed books and music, the letters and notes of which were raised; but this manner of acquiring knowledge was not equally well adapted to all minds, for the degree of intelligence was by no means equal; classes and categories, therefore, became necessary; manual occupations were given to the blind of inferior intellect, and the study of music, to those endowed with a more favourable organization. The boys were taught shoemaking, weaving, basket-making; the girls bobbin-making, fringe-making, and other simple and useful works.

Various objections may be made to these trades, particularly those which necessitate constant repose, or too little exercise, or habitation in damp places; but the trades which necessitate most action are more advantageous. In the education of the blind, it must never be forgotten to place them in conditions favourable to the maintenance of health. The progress of mechanism has rendered the profits resulting

from manual labour so trifling for the blind, that music has become one of their most advantageous resources. How much delight may not be derived from the cultivation of this talent! how greatly may not the mind be elevated! what harmony is not created for the lonely state of those deprived of sight! Who does not recollect the sublime inspirations of Beethoven? Was it not during his blindness, that Milton composed part of his harmonious and sublime verses? Music, and more especially sacred music, may become very useful and consolatory to the blind. The blind require bodily exercise, their minds must have repose from the fatigue of meditation and loneliness, to which they are condemned. And as of all gymnastic exercises, after walking, singing is one of the most salutary, different hours in the day should be allotted to vocal music.

When the unhappy blind have attained the power of earning a livelihood, or by useful and pleasing occupations, are enabled to pass their time agreeably to themselves, their health improves, and a service is rendered to the state; for there is no country in which a number of individuals afflicted with blindness are not to be found. In 1819, in Austria alone, there were 36,000 born blind, or became so in infancy; and it is only since 1805, that an asylum for the blind, has been formed at Vienna, with a view to alleviate their unhappy lot, by communicating instruction, and

making them useful to themselves, and to society.

Institutions of a similar nature, have been successively founded in England, in 1799—at St. Petersburg, in 1806; Berlin, in 1807; at Prague, in 1808—at Amsterdam, in 1809; at Dresden in 1810; at Zurich, in 1811. Thus, France, by its example, will have contributed to render to society, individuals who seemed separated from it by birth.

But if blindness constitutes an incurable deformity, there are other defects of sight which may be cured by a good education; strabism, which has become habitual, and which originated in negligence or imitation, may be corrected. We are acquainted with several persons who were greatly disfigured by squinting, and we found it possible to effect a perfect cure, with little difficulty. Strabism may depend on a morbid state of the brain, or of the optical nerve, in which case, parents or governesses cannot correct this defect. Strabism may be the symptom of disease; if so, the disease must be treated to cure the strabism.

CHAP. XV.

On Stammering.

STAMMERING is a greater or less difficulty in speaking; there are various descriptions of stammering; sometimes hesitation, repetition, or painful suspension of the faculty of articulation; occasionally there is no power of uttering either a syllable or a word. "Stammering," says Magendie, "may prove an infirmity much more painful than complete dumbness."

It is when children begin to speak that a habit of stammering is contracted; and where no other cause can be assigned, it may occur from an inequality between the mental and physical powers —an incapacity to give utterance to the precocious development of the mind. In all cases, the first attempts to speak should rather be moderated than excited.

Habit, and bad education, are among the number of causes of stammering, notwithstanding the opinion of Majendie, who attributes it principally to an instinct which makes man graceful or awkward, and gives intelligence or vacancy to the features; this instinct, presiding over the innumerable movements requisite to voice and speech, is but the natural constitution, offering irregular development of all parts of the body: it

must be remembered, that in the muscles which serve for articulation, some depend entirely on the will; others do not, or at least to a very trifling degree. Stammering mostly consists in the inequality of the power of the muscles, and is corrected by exercise and suitable positions given to the tongue.

An American lady discovered the means of curing stammering. Becoming a widow at the age of six-and-thirty, she was kindly received in the family of Dr. Yates, where she met with the most disinterested friendship, and thought she could not better prove her gratitude than by seeking the means of curing one of the daughters of her benefactor, aged eighteen, who had a great impediment in her speech. For this purpose Mrs. Leigh read all the English authors who had treated this subject, but not finding the desired information, she confined herself to the observation of the infirmity. After many fruitless attempts she thought she had discovered the immediate cause of the impediment, and invented a system of exercises of the organs of speech, which was completely successful in effecting a radical cure.

Mrs. Leigh observed, that when a person stammers, the tongue is placed in the lower part of the mouth instead of being applied to the palate, as with those who have a clear enunciation; she concluded that by advising the stammerer to

raise the tip of the tongue, and apply it to the palate, the evil would be remedied.

No difficulty is attendant on this effort, as the motion of the tongue is subjected to the will. It is true, that the enunciation is seldom clear, a *thickness* in the speech still remaining; however this may be, by elevating the tongue and applying it to the palate, a certain mode of curing stammering is attained. Mrs. Leigh took great pains to make her pupil speak in this manner, and a cure resulted. Elated by her success, Mrs. Leigh renewed the experiment on several other persons afflicted in the same manner, and finding her method still successful, she opened an establishment at New York for the cure of stammering. In the course of five years a hundred and fifty persons left this institution quite recovered. The time necessary for a complete cure varies according to the degree of energy of mind of each individual, much more than on the intensity of the defect. The longest treatment has not exceeded six weeks, and it is not unusual to find it terminate in a few days,—or even in a few hours, when the stammerer, who is told to raise his tongue, quickly feels the propriety of the observation, places confidence in the remedy, and feels certain of success.

Mrs. Leigh's method was soon made known, and universally adopted throughout Europe. New methods were discovered, but as they are

not within the province of parents we need not now enter into a detail of them, but merely give Dr. Voisin's account of his own cure, which is so simple that it deserves to be cited, and so successful, that it is scarcely possible to suppose he ever had any such defect.

"Chance," says Dr. Voisin, "first led to its discovery. I was reading a paper aloud before a society, and wished to do so quickly, when accidentally casting my eyes on a looking-glass before me, I perceived that I placed the right hand under my chin, so as to lower the inferior maxilla, and keep the mouth half open; it immediately occurred to me, that this instinctive and mechanical movement might possibly contribute to make me read with greater ease. When I ceased the pression the difficulty of speech returned, but upon replacing my hand in its former position I spoke readily. Endeavouring to account for this mechanism, I observed, 1st, That the mouth in the position I have described is kept half open, the distance between the teeth being a line, or a line and a half. 2nd, That the tongue, left in a state of repose, places itself against the inferior dental border, while during pronunciation, it projects forward and upward, but is drawn almost immediately behind the alveolar arch. 3rd, That a medium pression is requisite on the chin; this should suffice to resist the muscles which move the lower jaw; without preventing its movement of ele-

vation, it should impede perfect approximation. Great nicety is required to procure this pression, and make it appear natural. Either the right or left hand may be used, the thumb applied on the chin, and the fingers free. "Since I have made the discovery," continues Dr. Voisin, "I often place my hand in this manner without being aware of it; and I have observed many timid persons do the same when speaking in public."

When we remember that the greatest ancient orator, Demosthenes, stammered, and that he cured himself by persevering in proper exercises, may we not in the present day be allowed to hope for a similar result, when observation and experience have given methods equally easy and certain?

CHAP. XVI.

Deaf and Dumb.

According to the researches of Mr. Edward Smalz, of Dresden, there exist in Europe, nearly a hundred and fifty thousand deaf and dumb persons; but it is only in Germany, France, England, and Switzerland, that these unhappy beings excite any degree of solicitude: in no other country is any care taken of their education, and they are reduced nearly to a state of imbecility, a burthen to themselves and to society.

If it be a humane act, to endeavour to bring a child, more or less deformed, to its normal state, and to perfect his senses; how much more consolatory, and worthy of man is it not, to give to a deaf and dumb child, a substitute for the two absent senses? If the blind be cast into darkness, and seem to stand alone in the world, the mute are not less lonely; in the midst of their fellow creatures they are as living statues, whose senses must be gradually called into action, and for whom a substitute must be found for the senses wanting. Confined to physical movements, before the veil be removed under which reason is buried, they have not even that unerring instinct which direct animals that have no other guide.

In the eyes of the vulgar, these unhappy beings are but organized machines, or idiots, which may, perhaps, be made useful as other domestic animals.

Deprived of the means of communication, the deaf and dumb, without education are scarcely able to exercise an art or trade in the least complicated. Wanting the senses which represent ideas and give to them a certain form, all the impressions they receive are but temporary; the images are fugitive, nothing remains in the mind to which they can refer, and that may serve as a term of comparison. Reduced to an awful solitude, a dead silence surrounds them, and accompanies them every where. The curiosity so natural to childhood,—this desire to learn, and to ask questions,—is lost to the deaf and dumb. But all is changed as soon as a benevolent philanthrophist seeks to establish a sort of connexion between the deaf and dumb and their fellow creatures. Some part of childhood is however lost to them, for they only begin to live when they begin to communicate, and all the time that has preceded has been a species of lethargy.

The state of the deaf and dumb appearing an evil without a remedy, parents felt dishonoured at having a deaf and dumb child in their family; they thought their duties fulfilled towards him, when they found him in food and clothing, and preserved him from the eye of the

world, by confining him in a cloister, or in an unknown abode.

The glory of having restored these unhappy beings to society and humanity, is due to the Abbé de Lépée, in France; before his time mutes were looked upon with pity, sometimes even with contempt, as a degraded species, incapable of improvement. It is true, some trials were made, but had only served to discourage the best intentioned persons. The origin of the discovery made by the Abbé de Lépée, appears to us sufficiently interesting to make it known to our readers; it also shows the steps to be followed with those who are deprived by Providence, of one or more senses.

Two deaf and dumb young ladies, residing in Paris, with their parents, had just lost a benevolent friend, who had endeavoured to find a substitute for hearing and speaking; both mother and daughters deeply lamented this loss. The Abbé de Lépée happened to call one day, during the mother's absence; he was received by the daughters, but they spoke not; he addressed several questions to each of the young ladies, but they made no answer, and remained with their eyes fixed on their work; he repeated his questions, yet no attention was paid to what he said. Not being aware that the two sisters were condemned neither to hear, nor to be able to reply, he felt uncomfortable at having intruded; when the mother returned home he apologized to her for

having entered during her absence, and regretted he should have given offence to the young ladies. The unhappy parent made known the affliction under which her daughters laboured, and at the same time, explained the attempts of their departed friend to compensate for the loss of speech and hearing. The Abbé de Lépée took his leave, deeply moved by the painful scene he had witnessed.

All languages, said he to himself, are but signs, as the drawings of natural history are but a collection of images, a representation of a number of objects; all may be understood by gestures, as all may be painted with colours, and named by words. Objects have shapes, and may be imitated; striking actions draw attention—by imitation they may be described; words are but conventional signs; why should not gestures be the same? consequently there may be a language of action, as well as a language of sounds and of words.

"The Abbé de Lépée was so taken up with these generative ideas," says his excellent and learned successor, "that he again paid the ladies a visit, and offered to become their preceptor;" the mother joyfully acceded to this proposition. He made several attempts, which did not succeed; he wrote down letters, they were imitated, but seemed not to convey a single idea; he wrote down the names of things, and shewed the objects they were intended to express; but words

are not images, and he was not understood. How difficult were the first steps of the inventor! and what assistance could he obtain under similar circumstances? Yet this great man succeeded in accomplishing the noble task he had undertaken, and in a very short space of time, his method was adopted all over Europe. But it seldom happens that an inventor suddenly reaches to the perfection of his work, and M. Sicard was destined to continue the good done by his predecessor—to perfect his method,—to share his glory, and the gratitude of mankind.

In 1792, Mr. Townsend, in England, endeavoured to follow the steps of these philanthropic Frenchmen; several works had already appeared against the almost general opinion, that the state of the deaf and dumb could not be improved; but the success obtained by M. de Lépée removed all doubt on the subject; and Mr. Townsend succeeded in forming, in London, the deaf and dumb institution, which still exists.

If it has been possible to find a substitute for an organ so important as that of speech, by the aid of signs, cannot these signs be applied under other circumstances? An individual, who is not deprived of all his senses at the same time, is always accessible to some few ideas. The senses, which lend each other mutual and powerful support in the normal state, may be to a certain degree substituted. Thus, the blind see by means of the touch and hearing. The deaf

and dumb express themselves by signs by the fingers. The peculiarity of the figurative language consists in its not being confined to any particular idiom; it constitutes an universal tongue that can be understood by men of all nations. It is, perhaps, to be regretted that the language of signs has not been more prevalent, and has not been preferred to the language of sounds. How weak is language when it has to express the sentiments of the soul!

"The language of words," says Mr. Sicard, "is but a conventional language, and is local;" what nation has so well selected words, as to be understood by the inhabitants of all countries? Passing over the limits of our own territory, we are all dumb; but signs are every where understood, and signs are the language of nature, more or less used in all countries.

We have related the story of the Abbé de Lépée, and much regret we cannot give the improvements made by his successors in different countries; the limits of our work do not admit of it. We shall merely observe, that the method adopted by the benefactor of the deaf and dumb is so simple, that its application does not require any extraordinary degree of knowledge. Various attempts have been made to teach mutes to understand by the eye and from the motion of the lips, without any manual sign, as also to articulate and speak; and though this plan may in various instances prove useful, yet we think

too great a degree of importance has been attached to it.

There is no reason why the method of teaching deaf and dumb children should be confined to an asylum. A lady of high mental powers, who had the misfortune to have a deaf and dumb child, did not give way to useless lamentations, but sought the means of improving his unhappy situation; and after seriously considering the subject, it occurred to her to send the little boy to a day-school, with children of his own age, and have him instructed in the same manner as they were; and in a short time he knew the alphabet as well as any of the juvenile scholars.

Every child in this school went to the teacher to say his lesson, twice in the morning, and twice in the afternoon; the little mute always doing the same, soon noticed the difference between himself and other children by observing their mouths; at length, when the letters were pointed out to him, he looked up, and seemed to inquire what they were. The teacher endeavoured to gratify his curiosity, and called the letters by their names, and in a few months the child learnt to pronounce the alphabet in his own way.

His parents treated him in every respect the same as their other children; he was taught to say his prayers morning and evening, by kneeling on his mother's lap; he went to church, and was made to be attentive; he was never allowed to be idle, either at home or at school. After he

knew his alphabet, and learned to spell, he could tell the names of all the persons he was in the habit of seeing: as he grew up he learned to write, and afterwards to draw, and he became in time a very eminent painter. Yet this mute had never been the inmate of an asylum; indeed, it is but prejudice which prevents parents sending deaf and dumb children to school, because during early infancy much is learnt from imitation and the company of other children.

It is an error to suppose that all the deaf and dumb are incurable; deafness is often owing to a material obstacle interposed between the auditive nerve and the external sounds, as sight is prevented by the existence of the cataract; in both cases it suffices to remove the obstacle. M. Deleau has written a most interesting work, shewing in what manner he taught the deaf and dumb, on whom he had performed an operation, to hear and communicate. Among some of these patients were examples of the auditive organs opened suddenly to noise and sounds. The first sensations of an unpractised ear, are to receive sounds, distinguish the place from which they come; gradually the sense of hearing improves, and the slightest sounds may be heard.

What we have said of the blind and dumb—of these incomplete and deformed beings, suffices to shew, that in the education of children, while all the senses are not paralyzed, we may, by means of the normal senses, make up for those that are

wanting, and, by different means reach the brain; and, as there are different degrees of idiotcy, the study we have made of the education of the blind, and deaf and dumb, will serve as a transition to treat of the education that may be given to some idiots.

If it be said, that we leave physical education, to treat of intellectual education, it will be easy to shew that we do not depart from our original subject, when there is question of giving supplementary senses—sight, hearing, and speech, to those who are unhappily deprived of them. The following chapter will show how far we may hope to make up for the deficiencies resulting from the anomalies of the brain.

BOOK THE FOURTH.

CHAP. I.

Physical Education of the Cerebral Organs.

A GOOD education tends to the perfection of man, and to the full development of all his faculties. It is not muscular strength alone, nor the intellectual faculties exclusively that are to be developed,—it is the whole human being. First, the body, as the principal and indispensable foundation of the human edifice; then the heart, which embraces the affections; the mind, which comprize all the operations of thought; let the body alone be developed, and we shall have but savages, and their brutal instinct; let the affective faculties alone be developed, and we shall have fearful inclinations to suppress—we shall have madmen and criminals; develop the mind only, and we may, perchance, produce some geniuses, but more certainly hypochondriacs, misanthropists, maniacs; and we shall, perhaps, agree with the philosopher who said, "that the most civilized men, the most elevated minds are but depraved animals."

"Physical and mental education," therefore, as Montaigne very justly observed, "must not be separated." In the present age we must depart from the exclusive education of Sparta, as well as from that of those moderns who only see that there is an intelligence to cultivate. As in the creation, God did not despise matter, and that it pleased Him to unite for a time, the soul to the body, it does not behove us to separate it. Can we possibly disunite the body and mind of man,—separate his intellectual faculties from his natural organization? Is man but mind, is he but matter?

God having united the mind to the body by mysterious links, has not, however, made them independent of each other. The mind is not free when the body is in pain; the body in its turn suffers; all the organic functions languish when the mind is affected by any moral cause; united like the Siamese twins, all feelings are common to each.

"The physical constitution," says Condorcet, "seems to influence the human intelligence, not as having the power of modifying it, but as opposing obstacles to its activity, or as giving strength to employ it with more constancy and liberty."

What this philosopher foresaw of the influence of physical organization on the human intelligence, has received greater development, and the *mens sana in corpore sano*, has partly found its confirmation in the works of Gall.

We have in the preceding books, given the study of the development of the human body during the first stage of life; we have considered it both in its regular and irregular growth. We have shewn that the alteration in shape, the degree of strength or weakness, caused continual disturbance in the different functions of the economy. There yet remains for us to study one part of the body, which is the brain—organ of thought and feeling,—of the affective and intellectual faculties.

Is it requisite that the shape of the brain be regular, in order to exercise its functions? Must there be equilibrium in its faculties, as there must be equilibrium in supporting the body, either seated or walking? Undoubtedly. The harmony of the functions is destroyed if our propensities be stronger than our intellectual faculties; this harmony is also destroyed if our intellectual faculties be stronger than our propensities. But how far can the brain, apparently unequally developed, fill its functions normally? Then again, when the cerebral apparatus has regularity of shape and development, are its functions in a state of equilibrium, which nothing can destroy? Certainly not. Consequently there is nothing absolute in the study we are about to make.

Between the highest and lowest intellectual scale,—between normal and vegetative activity, there are numerous intermediate degrees. The brain undoubtedly rules over all other organs, and

keeps them under its dependence, regulates their functions, gives them animation, or moderates their activity. Without the brain, nothing is right,—all languishes; if it be wholly wanting, life cannot exist; if it fail partly, life is but a species of vegetation. When this organ is but slightly developed anteriorly, life is possible, but the individual is imperfect,—he is an idiot; he has feelings and propensities, and may receive a certain degree of education, but is ever condemned to a secondary rank, a species of intermediary between man and brute.

Man is not, however, wholly in his organization; "he is," says Villermé, "as much the produce of his physical and moral atmosphere, as of his organization;" and it is the happy circumstance of being modified by surrounding objects, which gives so much influence to education and power over the ulterior acts of life.

But if we have admitted, that in the physical education of the organs of motion there exist such an individual state, as required on the part of the physician special application, we must also admit that the brain not being equal, neither is the degree of intelligence equal. It, therefore, follows that education is and can be but relative, or its results will nearly always be irregular,—sometimes opposite. Thus, while education has most marvellous effects in one child, its results are trifling with another who is an idiot; consequently there must be something to study prior

to the system of education,—there is an organization, more or less regular, more or less susceptible of development and improvement. The indispensable condition of all normal and harmonious functions is the healthy state of the organ. Man is as an instrument that we must know ere we can draw sounds from it. In vain, should we say, with Hamlet,—

> "——— Govern these ventages with your finger and thumb, give it breath with your mouth, and it will discourse most excellent music."

The reply would probably be, like that of Guildernstein,—

> "I have not the skill."

—which skill consists in first knowing the instrument, and then how to draw forth the sounds.

Education being, therefore, the art of giving value to man, and of developing in the individual all the perfection of which he is susceptible, it will differ according to the state of the organization. The brain, therefore, requires to be studied as well as the other organs.

The deformities of the skull, and the deviations from a medium state are very common; the head is either too large for the body, or it is too small; it is depressed at the top, or there is absence of symmetry in the different parts; in

each of these cases, the brain undergoes various alterations. It is compressed wholly or in part, and its functions are disordered—sometimes even to madness, at other times brought to the lowest degree of idiotcy.

The attempts hitherto made to determine the dimension, shape and weight of a *medium* head, to serve as a comparison to the deformities and deviations from this type, are far from being conclusive, but these attempts may however, be considered as a progress. It remains for us to examine, if the intellectual and moral state may be appreciated by the external configuration of the skull, so as to be for us as useful a sign as those by the aid of which we could recognize spinal deviations; and in this case what advantage could be derived in the education of the affective and intellectual faculties. These two questions are of the highest importance, and lead us to the appreciation of phrenology, which has already attracted so great a share of public attention; as well as that of orthophreny, which is scarcely known.

CHAP. II.

Phrenology.

An enthusiastic eulogium on phrenology will not be found here. Putting aside the works of Gall, on anatomy and physiology, we have to consider phrenology in its connection with education. Gall is chiefly known by his craniologic system, from which so much good was expected to be derived in the education of youth; and to this system we shall, therefore, confine our observations.

Is it considered as an acknowledged fact, that a large head is the privilege of those endowed with a high degree of intelligence, and that the protuberances felt on the skull *absolutely* correspond with the faculties attributed to them by phrenologists? Then again, what advantages can education derive from cranioscopy? We shall endeavour to solve these questions, as they comprise that part of phrenology, offering the greatest general interest.

Gall has laid down as a general and absolute rule, that the development of the intelligence is according to the size of the head. Without refering to Aristotle, who did not admit the preeminence of large heads, numerous facts daily occur, to shew that this rule can by no means be considered absolute: cerebral development

compared to development of the body, is a contradiction to it; as the more the child grows, the smaller is the brain in proportion to the rest of the body; yet it is beyond doubt, that the functions of the brain progress with the general growth.

We must, therefore, reject the opinion that the size of the organ is in proportion to its power, or else we must admit that intellectual power is greater during childhood than at any other period, as the nervous system, according to the observation of Bichat, and all anatomists, is proportionately more considerable than in the succeeding years.

The facial angle of Camper, the occipital angle of Daubenton, and the comparison of the facial superficies of Cuvier, tended to appreciate by induction, the development of the human intelligence, but too many facts formed an exception to these rules, to allow even authors themselves to consider their system in as absolute a manner as Gall and his school.

Camper, who only sought in the facial line a character of beauty, fixed the extreme term at ninety degrees; according to Esquirol there are idiots, whose facial line exceed this number, and rational beings, whose facial lines do not amount to eighty. If facts of this nature suffice to affect the system of Camper as well as others, we must acknowledge that the works of Parchappe, Leuret, Lelut, and the numerous, though scattered

observations of those members of the faculty who have treated of madness, suffice to shake the confidence of those who think to measure all human faculties on the surface of the skull by the line or inch; even idiotcy, which is generally characterised by the smallness of the skull, sometimes sets the absolute law of Gall at defiance.

"In fact," says Esquirol, "there is no size or shape of head common to idiotcy, and though there are idiots with large heads, yet neither the size nor shape of the head can be considered as a rigorous indication of the sensitive and intellectual capacity." Then, again, Dr. Parchappe says, "that small heads do not exclude the possibility of a high degree of intelligence." This gentleman, seeking to determine the medium, found, that the heads of three idiots rose from 550 to 558 millimetres each; and the measure of of the head of Bigonet, member of the convention, who was the subject of a minute and pompous biographical notice, only measured 550 millimetres.

We could bring forward numerous facts of this nature, and it would then be impossible not to admit that the general rule asserted by Gall is not *absolute;* and that numerous exceptions at least, compel us to hesitate ere we decide on the state of the individual, merely from the shape of the head. If Gall would not admit the possibility of an ordinary degree of intelligence,

unless the head came within a certain limit; —and he has been careful to give the smallest size to idiots, which limit we also admit;—it is, nevertheless, worthy of notice, that the heads of fifty intelligent men having been measured by Mr. Parchappe, seven were smaller than those of some idiots, and thirteen were but very little larger; which fact tends to the following proposition,—that intelligence, in its normal state, may be found in a head the size of which is less, or equal, or but little superior to that of an idiot.

One of the most celebrated staticians of our epoch, M. Quetelet, also endeavoured to ascertain if it were possible to appreciate the development of the intelligence, as he had sought to determine the medium height of man, his strength, and weight; but phrenology was powerless in affording the means of attaining this end. "Without entering into an examination of the doctrine of Gall," says the Belgian statician, "it is to be regretted that his principles have not yet been subjected to the direct observation—that the law of the development of our faculties at the different ages corresponds with the law of the parts supposed to correspond with the brain, without knowing the relative proportions of the different parts. It appears that we have hitherto but very slight information on the law of development of the brain, or of its size and weight at the different ages, either in its medium, or in its limited value. M. Quetelet gave so little im-

portance to craniosopy, that the medium of mental and intellectual qualities is only indicated in his work; and professing an inability to appreciate the faculties but by their effects and actions, he confessed that the necessary elements were wanting to attain this end, as society does not take the same care to record and appreciate courageous and virtuous deeds, as it does to register crimes. What M. Quetelet has left undone, M. Parchappe has attempted, although not favourably to cranioscopy.

If it be not granted, *that the degree of intelligence may be ascertained by the size of the skull*, is it at all more certain, that the external state of the skull represents the state of the brain, and that the protuberances felt on the head, fully correspond with the faculties assigned to them by phrenologists?

This second proposition will bear still less examination than the first, and it is because it cannot be asserted that the size of the skull exactly corresponds with the size of the brain, that the latter proposition is often false.

When Gall's system was first brought forward, this objection was made to it, and his partizans have not yet been able to remove the objection.

In the manual of phrenology, by George Combe, this objection has not been made; it proved easy to refute all others. No, the skull does not exactly represent, either in size or shape, the shape and size of the brain, because

the bones of the skull are formed of two planes; one may be moulded on the brain, while the other is modified by the muscles.

We have now before us a skull, horizontally cut, and we in vain seek on its exterior those projections and depressions that we find internally. While refering to this absence of parallelism in the two planes composing the skull bones, Mr. Combe observes, that this difference does not exceed an eighth of an inch; but an eighth of an inch is a great projection on the surface of the skull; and this single circumstance would suffice to imprint on the whole system a source of error, so much the more constant, that the thickness of the bones of the skull varies in different points, according to the age of the individual. "We should be widely mistaken," says a physiologist, "were we to judge the capacity of the skull, or the size of the brain, by any external measure we might take." Does it follow that there is no connexion between the skull and the brain? Most undoubtedly not; and it is a fact that a large head generally contains a large brain; but when from this generality, which admits of so many exceptions, individual cases are taken, it must be acknowledged that this connexion is subordinate to several causes of variation, and particularly to the thickness of the bones, which thickness varies, independently of a state of disease, and even of age and sex. We cannot avoid seeing that the influence of this cause, or

its results, suffice to render it impossible to decide in individual cases, of the extent of the brain by the size of the head.

"The same causes of error," continues Mr. Parchappe, "may exist with regard to the appreciation of the size of the cerebral organs, and then we must admit that *cranioscopy* is as fertile in illusions as all other physiognomical systems." As to the second part of the proposition, whether protuberances on the skull correspond with the faculties attributed to them by physiologists, it is useless for us to refute; but we have just seen in the Phrenological Journal of Paris, a remarkable circumstance, not devoid of interest as relating to our present subject.

"*Jacques Lebon*, a native of Arras, had early embraced the ecclesiastical career. When the French Revolution broke out he was a curate, but taking advantage of the anarchy and disorder then existing, he entered deeply into politics, and became a partizan of Robespierre and St. Just, members of the Committee of Public Safety. He was sent into his native town, and there became the scourge and terror of his fellow-citizens; he revelled in human blood; the executioner was his friend and companion. This monster surpassed in ferocity the most cruel agents of these fearful times. He caused the innocent victims to be led to the scaffold by the sound of music; his crimes were so great, his excesses so horrible, that no historian has believed

him sane'; but whether madness, or criminal perversity carried to the highest degree, what was the result of the examination of his head after death? If number three be taken as a term of comparison or mean term, *combativeness, destructibility, secretiveness*, are beneath this mean term. 'This man,' said the phrenologist who examined his head, 'is the most singular example I have ever met with of the influence of surrounding objects on the organization. Two distinct characters seemed to exist in the same individual; the one benevolent, affectionate, charitable; the other, cruel and destructive. Benevolent and happy in his curacy; before the scaffold at Arras a delighted spectator of the innocent blood there shed, and shewing his exultation by singing the sanguinary productions of this terrible epocha.'"

There are frequent examples of exact proportions in the heads of individuals renowned for their crimes; these facts should make the partizans of craniology careful lest they give it too much credence. It is because this system has great attraction, that we must warn those who cannot verify it.

It is certainly true, that a head badly organized, with a marked depression, might lead to the supposition that the brain cannot fill its functions, and that the intellectual faculties are wanting in energy; this is mostly the case with idiots, but as the skull is sometimes well shaped, while there is perhaps more or less atrophy of

the brain, it follows that we must not confine ourselves to this indication alone.

In applying cranioscopy to education, some partizans of Gall's system have gone so far as to believe that the external state of the head sufficed to indicate the sort of education suited to each child, and others have proposed the pressure of certain instinctive protuberances, which might in their opinion prove anti-social. Ridicule did justice to these erroneous opinions.

In the study of children's dispositions more knowledge can be gained by their instinctive and intellectual manifestations, and by observing their conduct, their propensities, their ideas, expressed either by word or deed, than by the external protuberances on the skull.

It is certainly more easy to judge of a child's intellect by its effects, than from the shape of his head alone; besides, it is thus we judge of the imperfection or anomaly of the organs, during early infancy. If a child does not speak, or endeavour to repeat the words his nurse tries to make him pronounce,—if he does not turn round when there is a noise,—if he does not seem struck by any sudden shock, or by the sound of music, we suppose him to be deaf and dumb, although apparently there may be regular development of the ear, tongue, and skull. But if the child hears and speaks with difficulty,—if there be in him a species of general heaviness, and that he has neither the activity nor in-

telligence of other children,—the eyes without expression, do not follow the light,—or if he squints, and his growth is slow, his limbs deformed, we may suppose this child to be born an idiot, or to have become so after convulsions, or any strong impression; these symptoms suffice to indicate the state of the child, even when there is no depression, or smallness of the skull, which is considered as a certain indication of idiotcy.

At other times, the child presents a regular development of the head and body, but is endowed with extraordinary activity; he learns quickly, is particularly sensitive; he appears thoughtless and absent, because whatever strikes his senses affects him; and though this child's head is smaller than that of most children of his age and size, yet is he remarkably apt and prompt at learning; his facility occasions both surprise and alarm; he grows suddenly, has fearful attacks of illness, recovers, and has still the same ardour, the same desire to understand literature, arts, and sciences,—all appear equally easy,—nothing seems to satisfy his activity. You may vainly seek for all these things on the skull; they are not written there. Must we then have more regard for the shape of the instrument than for the harmony it can afford? Shall we judge of the ability of a lawyer, a physician, a musician, by the shape of his head, rather than by the produce of his intellectual faculties? Would a phrenologist be better able to say what were

Milton, Shakspeare, West, or Lawrence, by studying their osseous remains, than we who judge of the eminence of those celebrated men by their immortal works? Who would dare to say, that the plan of St. Paul's was delineated on the skull of Sir Christopher Wren?

The formation of the head of a madman is often very regular, and in deranged intellects but little alteration of the cerebral substance has been found after death; and yet are all the faculties to be appreciated by the shape of the bones! An individual is deranged—his disease depends on an affection of the heart; when in the least excited, blood rushes to the brain, and a fit of madness comes on; what is then to be seen on the skull? Is there any thing that indicates madness? Very seldom.

There is a hypochondriac but lately at the head of great affairs,—he loses office, indolence succeeds to great activity; wholly taken up by his feelings, the least change that takes place alarms him, and, according to Montaigne, he creates a phantom, to whom he speaks. Is not this individual a maniac?—yet is the shape of his skull changed? It is easy to understand why we cannot take craniology as a guide in our studies, and why we do not entirely reject it; but we are more disposed to judge of the education suited to children by their intellectual or instinctive manifestations, rather than by the shape of their skull.

We cannot certainly deny that the develop-

nent of the brain acts most powerfully on the activity and regularity of its functions; but is there not any specific organization which has also a strong influence on it? Are there not internal and external causes which disturb the apparent equilibrium of its different parts? Suppose, for instance, two children having their heads formed alike, will not their peculiar constitution, their diathesis, modify this tendency? Will the vocation of a rachitic child be similar to that of a healthy one? Our observations relative to diathesis, are applicable to all the incidents of life, to the social position, to a good or bad education.

What then becomes of the confidence granted to the topography of the head before or after death? What becomes of the advice of phrenologists, as to the choice of a profession to be determined by the conformation of the head? Who can say that the infirmities of Pope, Talleyrand, and Byron, had no influence on their life and the choice of their career?

If we have already insisted that children should not be brought up by systems which only have regard to intellect, without considering the organization, we must also insist, that too much importance should not be given to matter, and that the shape of the head alone should not be considered, so as to attach to it an exclusive importance; yet it does not follow that we consider phrenology useless as regards education,

for phrenology consists, not merely in the study of cerebral protuberances; phrenology is also a system of psychology; but in education we only consider the shape of the skull as an element to direct us in the choice of the means to be employed. Before we begin to teach a child, we should be acquainted with his degree of intellect, his propensities, and his aptitude. When these faculties are not inscribed on the skull, they will be revealed to us by the child's habits and manners. We shall have to consider the physical, hereditary, or acquired constitution, —the general conformation of the body,—climate, age, sex, and social position, as well as the species of education he has received. We must also place before him different objects, and remark those which interest him most: a helmet and a shield recalled Achilles to a love of glory and betrayed him among a group of women.

Although in the education we have to give, the shape of the cerebral organization may not invariably shew that nature has or has not been bountiful, and that we cannot always read on the human skull, idiotcy or genius, the weakness or energy of sentiments and passions,—we do not reject any light phrenology may afford in the question of education; but we are, nevertheless, compelled to say, that the system is not yet fairly judged, and that more facts in confirmation are requisite before it can be considered as an absolute and sufficient rule.

Had we to determine under what influence man degenerates or improves, phrenology would be far from useless; for it does not counsel to leave to destiny or chance the development of the benevolent qualities, the improvement of talents, nor the repression of vicious inclinations. "It teaches, on the contrary," says Lelut, "all the power of external agents, in causing the development of the faculties and of their immediate action; if certain aptitudes, certain talents, are developed without the concurrence of external circumstances, faculties of a lower order require this concurrence, and weak organizations still more so. For in how many persons have study and cultivation produced results which could never have been attained had nature been left to herself!

A child may perhaps only have negative qualities, either partial or general; in the first case there are various resources; in the second but few. But while the child has one or more senses which convey impressions to the brain, and that the brain is able to receive them, education can be effected. Man's intelligence is of such a nature that all the senses and all wants may reach it; if one sense be wanting another may be substituted. The seeds of the faculties are sown in our organization,—it is the province of education to develop them, guided by the knowledge of the organization itself, and that of the influence of external agents.

CHAP III.

Influence of the Body on the Mind.

The influence of the body on the mind is so generally known, that we think it useless to enter into long details. Cabanis has left to science his excellent dissertations on the subject. It is not only the skull, which has so much influence on the mind by pressure on the brain, but also the general state of the body, the age, the sex,—the state of the heart, of the bowels, of all the parts of the organization; we cannot consequently confine our observations to the state of the head alone. To limit a question which of itself would suffice to fill volumes, we might look upon the head as the centre of the nervous system—on the brain as the seat of the mind; but although it may be said that every alteration of the form of the skull may have a direct influence on the functions of the brain, the exceptions are sufficiently numerous to render the form of the head of exclusive importance. We shall in the first place, have to consider the different degrees of mental deficiency, from mere imbecility to complete idiotcy,—then what may be done for ill organized beings, and apply an orthophrenic system, as we should apply orthopedy in deviations of the bones.

The able physician who gave the name of or-

thophreny to the method he intended to apply to inferior as well as to eccentric intelligences, grounded his views principally on phrenology. We conceive we have, in the preceding chapter sufficiently shewn, that craniology is yet too hypothetic to serve as a sure guide in education.

Children capable of receiving an education may be divided into three great series.

Those who require to be stimulated—from the imbecile to the idiot. Those who require to be moderated,—precocious children, with intelligence of a high order, and propensities too strongly developed. Children with ordinary abilities, for whom the general plans of education are well suited. We shall only give our attention to the two first series.

Between the thinking man and the idiot who does not even shew any instinct, the different degrees are very numerous. Hoffbauer endeavoured to describe all the variations of weak intellect, from the slightest appearance of inferiority to fatuity, or positive idiotcy. But these divisions, or subdivisions, would not suffice to account for the diversity in the various degrees of energy and weakness of the intellectual and moral faculties. Some, in fact, have little or no memory, others no judgment, some no reflection, and some want the power of concentration, which we denominate the faculty of attention; others, more unfortunate, are entirely devoid of intellect and

feeling. These five divisions appeared minute to Esquirol, who, under the name of mental deficiency, merely established two degrees of idiotcy —imbecility and positive idiotcy; we shall in this instance follow Esquirol's plan, as beingcalculated to facilitate the study of children of the first series.

Imbecility. Weakness of Mind.

Imbecility may be congenital or acquired. With most imbeciles the organization is less perfect than with individuals normally developed. We acknowledge that the intellectual faculties are nearly always more or less connected with the state of the organization; yet we sometimes find in this category a regularity of the skull which does not account for the faculties wanting: thus, we may see imbeciles with ideas, memory, affections, propensities, and able consequently to receive a certain degree of education, but they seldom acquire extensive reason, or the information which their social position would have enabled them to attain, because some of the principal faculties are always wanting; and though they may learn music, reading, writing, and the exercise of a mechanical art, they do so imperfectly. There is no spontaneity in imbeciles,—it seems as though they could not think alone; all is external, the sensations pass rapidly, and leave no useful traces, unless habits are contracted.

Imbeciles are generally timid, fearful, and obe-

dient; they have sometimes been made tools in the hands of depraved individuals, and led to the commission of crimes of which they knew not the intent. Imbecility may be due to deafness, or to the privation of a sense; the imbecile from birth, is more difficult to bring up; the accidental idiot has a far better chance. When Gasper Hauser reached Nuremberg, he was an accidental imbecile; the state of repose to which his senses had been subjected, had so weakened them, that they were unable to support the sensations of the external world. Victor, or the savage of the Aveyron, was also imbecile, but deafness, and the life he had led in the woods, made him approach nearer to the idiot, and to the brute, than to man. Left to himself, the imbecile is degraded, the seat of intelligence he possessed is weakened, and he falls into the last stage of idiotcy. In relating the case of Victor, we shall form a judgment as to the species of culture best suited to imbeciles; and other examples will serve to shew the possibility of their education.

A. B. was born weak, yet she grew well until she was two years old, when the development of the organs was arrested; she could only walk at four years old, and could not speak till she was seven: at eleven, she was admitted into the hospital *de la Salpetrière,* and she was nineteen when Mr. Esquirol drew up an account of her case. He found the head remark-

ably regular, the forehead high, large and well developed; Camper's facial angle was nearly ninety degrees; dark and thick eyebrows; large blue eyes; mild and most expressive countenance; limbs well formed; general health good; she had a great appetite, and was very greedy. She understood all that was said to her, with some powers of memory; she could relate what passed in her father's house,—replied slowly, but correctly to any question, yet made few enquiries; but she asked for dolls, and playthings,—sang a few songs,—knew the value of money, which she counted, and saved to buy sugar plums; she was fearful and timid, full of vanity, and pleased by flattery; she knew her letters, and could write a few words; her reason was that of an ordinary child of seven or eight years old. "It is probable," says M. Esquirol, "that under favourable circumstances, she would have acquired a degree of instruction that would have enabled her to frequent society."

D. C. was very delicate in her infancy; she was a backward child,—it was late before she could walk; when five years old, she had a fright, which brought on a serious illness: from this time her intelligence made no progress, though her organs were well developed; her head was regular. As for the intellectual capacity of this idiot, says Dr. Esquirol, she is attentive to what she sees and hears; she judges pretty well of usual occurrences,—her answers are correct, but she hesitates. All attempts to teach her to work

or read have proved fruitless; she knows some of her letters, but nothing more; she is extremely unsteady, and can never remain long in the same place; when the shape of her head was drawn, she jumped off her seat every moment; it was quite impossible to take the mould of her head. The regularity of the shape of the head, and the harmony of the features formed a striking contrast with the weakness of the intellect. These two cases would afford ample matter of consideration to a thinking mind. The two imbeciles were placed in an asylum, and left to themselves; is it surprising, therefore, that no greater progress should have been made? And yet they are quiet, obedient,—they imitate,—they know the value of money, they ask for it; they shew attention in many instances; they are voracious, greedy.

The following is the case of an idiot of the lowest order, yet we shall see her communicate by signs,—be sensible to music,—to rhythm; follow attentively the movements of the fingers of a pianist, and be so concentrated in the charms of music, that gluttony is suspended before any tempting fruit! This case,—one of complete idiotcy, taken from M. Esquirol's work,—will also illustrate the arguments we have to make in favour of education for weak-minded children, and for some species of idiots.

M. Queneau was received in the hospital at the age of twelve; she was of a good constitution; her face was more developed than her skull; the

top of the head was flattened, the occipital small, the forehead low, and inclining backwards; she holds out her hand to every one, and begs for money, with which she buys cakes; she cannot dress herself; when she tries to speak, she utters a kind of shriek, and continues to mutter until she obtains what she wants; she mostly communicates by signs, she is grateful for any kindness, and fully understands all that is said to her, when the words are slowly articulated, and spoken very loudly; habitually, she is good tempered, but becomes very violent when her appetite is not satisfied. "This idiot is a musician," says M. Esquirol. "If she sees dancing, she jumps about, and keeps good time; if she hears any singing, she tries to imitate the tune, not the words; she knows many airs; she heard some one play on the violin, she listened *attentively*, and found from whence the sounds proceeded. A gentleman composed an air, she followed it, and when the air was commenced a second time, and left off in the middle, she continued it to the end. Fruit, of which she is very fond, is placed before her, and when she is about to take it, she hears a song,—she leaves the fruit, to listen to the music, but when it is finished, she seizes the fruit greedily.

On the 21st of August, 1833, M. Litz was invited by M. Leuret, to play before Queneau, in the presence of Drs. Mitivié and Pariset; she quickly caught the airs, but trying to repeat them, she shewed great impatience; while Litz

plays on the pianoforte, she remains motionless, her eyes fixed on the fingers of this great performer; or else she falls into convulsions, twists herself in different directions, bites her hands, stamps on the ground; the transition from deep to acute sounds, causes a sudden contraction of all the muscles, as if she were struck by an electric shock. Dr. Leuret led her to an adjoining room, and there shewed her some apricots, but she again heard the music, and until it had ceased did not touch the fruit. Notwithstanding this singular musical capacity, Queneau has not on the skull, the protuberance pointed out by Gall as the organ of music. Dr. Esquirol has classed this idiot among those who have reached the lowest state of degradation.

If the conformation of the brain does not always indicate the state of the intelligence in imbeciles, it is not so with positive idiots, who are rachitic, scrofulous, or scorbutic; for in these cases the head is as much deformed as the other parts of the body,—it is far too large or too small, flattened in different parts, especially at the top; the features are irregular, the forehead low, narrow, and flattened. "Idiots," says Dr. Esquirol, "are commonly deprived of one or more of their senses; taste and smell are often blunted, and as the remaining are not acute, there is no compensation for the senses that are wanting. Idiots are particularly awkward, their limbs are not of equal size, there is a striking absence

of symmetry. Incapable of attention, idiots cannot direct their senses; they hear, but do not listen, they see, but do not look; they have no idea of order, they are slow and awkward."

Dr. Esquirol states, that nearly all the idiots, for whom his advice had been asked, knew some tunes, and could sing, more or less. Idiots are sometimes remarkably insensible, although in full possession of all their senses. "How can any intellectual manifestation," says he, "be obtained from an imperfect instrument?"

The task is difficult, no doubt, but if we cannot have brilliant results, may we not hope for some benefit, by following the method used with the deaf and dumb, or with the blind;—this is the province of orthophreny.

There is another species of idiotcy, partaking of the character of the two preceding; it is sometimes partial, and constitutes but a state of imbecility; sometimes general, and resembles constitutional idiotcy. This state is peculiar to those individuals who, from infancy, have been kept in a state of deep ignorance, from which they could not free themselves; in this case, life is but prolonged infancy; and what would man be were he left to himself, without the assistance of society? In this class may be placed wild children, who have been found in the woods; to this class also belongs Gasper Hauser, whose idiotcy was but artificial,—in other terms it was the total absence of all education. Gasper Hauser serves to shew what the body

becomes when deprived of the influence of physical agents, and of education; other individuals offer more than one lesson for the development of the brain.

The philosophers of the last century, and Rousseau principally, have given great importance to the case of wild persons found in the woods. The philosopher of Geneva hoped to see in these individuals the type of the human species, and considered them more perfect than civilized man! It is to be regretted that he had not an Emile of this description to bring up. Peter, the wild boy, who had all his sympathies, was not an idiot, neither was he a type, nor the true child of nature, though considered so by Rousseau and Monboddo.

Peter, the wild boy, had been found naked in the fields; George the first, sent him to Hanover, from thence to London. At this period, the controversy respecting innate ideas was at its height, and it was hoped that this child might help to solve the difficulty; so that instead of seeking to give him an education suited to his situation, he was to serve as an example in a metaphysical question. We are not acquainted with the means employed for this purpose by Dr. Arbuthnot, to whom he was confided; but as this poor idiot could not serve for any psychological discovery, he was sent to reside with a farmer in Hertfordshire. His tongue was very large, and he could not move it well; a surgeon advised it to be cut, but the operation was not performed.

"Peter was a harmless and obedient creature," says Mr. Lawrence, in his lecture on physiology, "he could be employed in little domestic offices, or in the fields, but not without superintendence; he could not be taught to speak; he had a taste for music, and would hum over various airs that he often heard. When an instrumental performance took place, he would jump about with great delight, till he was quite tired; he was deficient in one important privilege of our nature, never having been seen to laugh."

After the preceding examples, who could recommend public education for children born with weak minds, or who have become imbecile through disease in early infancy, or arrested growth? What common preceptor could hope to reach the brain with incomplete senses? A task so difficult cannot be undertaken, and brought to any good termination, excepting under the direction of an able physician. How far are we from the education Rousseau applied to his Emile,—who was in full possession of all his faculties, and with perfect organization,—to that special education suited to imbeciles!

As rhetoricians and philosophers have done but little for children born with weak minds, it is for the faculty to befriend them. Let us judge what might be effected for those whose idiotcy even seemed to surpass that of the individual we have cited.

CHAP. IV.

Orthophreny.

THE *ensemble* of the means employed to draw congenital or accidental imbeciles from their unhappy condition, may be termed orthophreny, as the name of orthopedy has been given to the means of preventing spinal deformities; and although Dr. Itard does not lay claim to the title of first orthophrenist, yet it is justly due to him.

At the commencement of the present century some hunters discovered in the forest of Aveyron a young savage, who fled from them. They took the boy home, and the greatest interest was felt for him: he appeared to be about twelve years old; he could not speak, or understand anything, and was considered as an idiot without hope of amendment. It was, however, thought that his education might serve for the history of the development of the human mind. Dr. Itard took charge of this pupil.

When he reached Paris, Dr. Pinel represented his faculties in such a state of apathy, that he was considered much inferior to many domestic animals.

His vacant eyes wandered from one object to another, but were never fixed; he was deaf; his voice was but a harsh shriek, which seemed to escape with difficulty from the chest. The strongest and most fetid odours, as well as the

richest perfumes, seemed to have no effect on him. His touch was confined to the mechanical action of seizing the objects near him.

He was incapable of attention, totally devoid of memory and judgment, and had not the slightest notion of imitation. His ideas were so limited, even those relative to his immediate wants, that he could not open a door, or mount on a chair to reach the food that was put at a distance from him; and his skin was so hard that he neither felt warmth nor cold! How then could the intelligence of this savage,—of this being, who had a human figure, but so brutal, that it seemed to belong to another species, be developed? All his faculties were obtuse; his eyes alone were good, but how was the attention to be fixed? Dr. Itard endeavoured principally to move the nervous sensibility by the most energetic stimulants:—to extend the sphere of his ideas by creating new wants, and increasing the number of his relations with surrounding objects:—to bring him to the use of language, by submitting him to the necessity of imitation; and finally, by frequently exercising the most simple mental operations on daily wants, and applying them to objects of instruction.

Five years constant care was bestowed by M. Itard on this unhappy youth: it is impossible to describe all the self-denial and patience required for this laborious undertaking.

M. Itard's first care was to restore to the skin

—vast organ of touch and sensation, the sensibility it had lost, and to soften it by frequent warm bathing, and to make the boy feel the difference of heat and cold by wearing clothes suited to the state of the weather; this first step proving successful greatly encouraged the preceptor.

All Victor's senses, with the exception of hearing, were slowly and successively improved, and the poor boy acquired a number of ideas till then unknown to him. But all attempts to make him speak proved unavailing; he was born deaf, and it was therefore judged right to educate him in the same manner as the deaf and dumb. It was long before he acquired any memory; surrounding objects made but slight and temporary impression; but as he advanced, the duration of the impression increased, and the memory acquired more development than could have been expected.

When Victor ceased to be privately instructed by his excellent master, he entered into the class of deaf and dumb, and showed that the imbecility which had been developed in the woods by his loneliness, was but accidental; and that nature had deprived him only of hearing, which is one of the most important senses.

What a vast difference between this young savage and the orphan of Nuremberg! One cannot bear external impressions, owing to his long confinement, and the other is unable to distinguish heat from cold! One falls into convul-

sions at the beating of a drum, and the other scarcely hears the firing of a cannon!

How much could have been done for Gasper Hauser had he been understood by those around him! and what agents were not necessary to reach Victor's brain, and make him alive to external impressions!

When there is that deficiency of intellect which has been classed by M. Esquirol under the name of imbecility and idiotism, what plan is to be pursued? what species of education is best calculated for individuals thus situated? The answer would be easy, but what we have related is too unconnected to serve as a plan, and we regret that the limits of our work will not permit us to draw one. We may only by general views indicate the means that we think might prove useful for weak-minded children. Dr. Voisin, to whom is due the merit of first calling the attention of the French government to the state of poor children of inferior intellect, had the advantage of being granted an hospital in Paris, to which all the epileptic and imbecile children were brought from the different asylums in which they had hitherto remained. The report made by Dr. Voisin, in 1833, and which has not to our knowledge been renewed, unfortunately offers but few *practical facts*, and nothing as to the mode of instruction. At all events, it is right to say, that he felt the necessity of making divisions, and separating idiots of different degrees. He wisely isolated those, who

deprived of the light of instinct, uttered hoarse shrieks, were disgustingly dirty, and reduced to a state below that of brutes.

Epileptic children, though some degrees better than the preceding, were also to be isolated; and in another part of the building were placed those children affected with partial idiotcy. But having made this topographic division, we have to regret this estimable philanthropist should have felt satisfied, and that his report contained but an account of more or less analogy between the conformation of the skull of these idiots and the opinions emitted by Gall. In short, Dr. Voisin seems to be more taken up with maintaining the system of Gall, and showing, that among partial idiots there could be no criminality, than in furnishing the means of curing their infirmities. The subject with which we shall terminate this work is therefore quite new. Experience may perhaps, lead Dr. Voisin to make some useful discovery; in the mean time, we are thrown on our own resources, and can only relate what we have learnt from observation, reflection, and practice.

"It was remarked half a century since," says M. Foderé, "that many persons of weak intellect have a peculiar talent for drawing, music, and poetry;" this singular fact appears quite inexplicable.

Some learn to play on the organ and pianoforte, without the assistance of any masters;

others make clocks and watches without previous instruction.

Dr. Esquirol observes, that some imbeciles have very remarkable aptitudes, and that whatever has any connection with these aptitudes is more easily understood by them.

It is extraordinary that it should have been ascertained that there were imbeciles endowed with a certain degree of intelligence, sensibility, memory, moral affections, striking facility for certain arts, and that no advantage has been derived from this observation.

While children have any organ capable of receiving impressions, would it not be easy, by means of sensations, to give them some ideas, notwithstanding their imperfect organization? and when there exists any particular quickness, why not adapt the education to it? When imbecility is congenital or acquired, and without deafness, the child has many resources; but if deafness be combined with imbecility, there is much less to hope. Preceptors of such children should have some medical knowledge; not that internal remedies may be depended upon, but because the influence of external impressions will be better understood. If an imbecile child receive an ordinary education, from which he cannot benefit, he will be laughed at by his companions, and despondency will soon add to his natural incapacity. If he has not a special edu-

cation, and is put in contact with other idiots, deprived of the resources of instruction and example, he cannot fail to become worse.

When a child has any organ of which the sensibility and functions are dormant, every means should be taken to bring them into action. Dr. Itard found his way to Victor's intelligence when he succeeded in restoring sensibility to his skin. It is of course difficult to substitute one sense for another with imbeciles; in whom the existing senses are weaker, and more uncertain than with the deaf and dumb enjoying strong health, and with the exception of speech and hearing, having a normal organization; but among idiots one or two senses always have a greater degree of activity than others.

Imbeciles and idiots are mostly awkward, there is no harmony in their movements; much benefit therefore may be derived from gymnastics, which may regulate the functions and organs of motion. Bodily exercise is undoubtedly one of the most useful to rouse the dormant organs. It suffices to know the advantages to be derived from exercise in madhouses, to understand all that could be derived from gymnastic exercises, suited to the state of the individual, and varied according to his progress. Baron Percy, physician to the army, having remarked that a great number of young soldiers fell into a state of apathy, and were attacked with nostalgia, which deprived them of

their faculties and rendered them almost idiots, he ordered gymnastic exercises; the stupor of the brain ceased, and the young soldiers recovered. It would seem that in exercises there are vibrations that re-echo in the brain, and give new vitality to obtuse sensibility.

Repetition, which in discourse is sometimes so forcible, also facilitates exercises, so as to cause the habit to be contracted: to attain this point, is to understand its power over man.

The aptness of weak-minded children should be carefully consulted, and far from neglecting it, duly cultivated, and a good direction given. "If we could unite several occupations," says Bichat, "it would certainly be those that have most analogy with the organs they put in action, as well as those relating to the senses, those which exercise the brain, and those which call the muscles into play." Unfortunately, ideas so simple and so true have never been followed; nearly all imbeciles or idiots found in the wards, have been judged by the common rule, which is still too often the case. If a child does not easily learn to read and write, it is called stupid, while it is perhaps the master, not the scholar, who is to blame. It should also be remembered, that men celebrated for a speciality, for any art or science, are nearly always deficient in the various branches to which they may not have given their attention. Is a poet expected to be

as clever a mathematician as an engineer? Is a mathematician expected to be a poet? It having been ascertained that a child is weak in intellect, he should no longer be judged by the common rule. We must seek to discover his peculiar taste, and not persist in trying to penetrate the brain without first having a knowledge of the direct road.

Imbecility and idiotcy are often caused by growth being arrested, and the development of the brain being stopped. If a boy of fifteen, has the same understanding as a child of eight, he must be educated as though he were but eight.

It has been remarked, that imitation was one of the most active faculties in children; education must therefore be made by action—teaching must be pantomimic, and composed of signs: is the power of signs not fully demonstrated in the education of the deaf and dumb?

Dr. Esquirol remarked, that nearly all idiots, for whom his advice was asked, were fond of music and rhythm. We have also observed the power of music on idiots, in the cases of Queneau and Peter the Wild Boy. A child who is sensible to sounds, should not be considered as an incurable idiot.

With the aid of music, could not order and regularity be given to all the acts of life? Can it not serve to attract and fix the attention? How powerful may not its effect be on the brain,

when we see Queneau, naturally so greedy, leave the fruit she was about to seize, and forget her gluttony, as if kept back by a magic charm, to listen to sounds which captivate her, and enslave her instinctive appetites? Is it not a realization of the allegory in the fable of Orpheus, who tamed the brutes by his music? and does not that fable allegorize the education of savages —species of idiots through ignorance?

Of all exciting agents of the nervous system, music is one of the most powerful. If its effects on individuals, enervated by civilization, may cause morbid sur-excitation, should it not be tried and applied to inferior intellects? Montaigne was daily roused from sleep by the harmonious sounds of music. How great is the power of music on the multitude!—on soldiers, just torn from the plough! The rapidity with which enthusiasm is thus communicated, shews how great the advantages to be derived from its application.

"Children," says Cabanis, "are fond of singing, they listen to it with pleasure, long before they can articulate, or understand a single word, and long before they can have any distinct notion relative to the other senses; and in its roughest state, the human voice can produce the sweetest sounds." Imbeciles offering to external impressions imperfect senses, are in the situation of those men of whom Montesquieu speaks,—they must almost be flayed alive to awaken their sensibility.

There must, indeed, be a very powerful excitation in musical vibration, for it to be felt even by the deaf, many of whom are frequently seen in villages, apparently deriving great pleasure from the movement of the church bells.

M. Deleau, after performing operations on the ear, made use of the sounds of bells, or some other loud noise, to teach his patients to hear. It is related by M. Arrowsmith, that a gentleman, by profession a miniature painter, born deaf and dumb, was particularly fond of music. He was at a glee club, and while the glees were sung, would place himself near some articles of wooden furniture, or a partition, door, or window shutter, and would fix the extreme end of his finger nails, which he kept rather long, upon the edges of the wood, or some projecting part of it, and there remain until the piece under performance was ended,—expressing all the while, by the most significant gestures, the pleasure he experienced from musical sounds. He was not so much pleased with a solo as with a full clash of harmony; and if the music was not perfectly executed, he would shew no sensation of pleasure. But the most extraordinary circumstance in this case is, that he was most evidently delighted with those passages in which the composer displayed his science in modulating the different keys. When such passages happened to be executed with precision, he could scarcely repress the emotions of

pleasure he received within any bounds; for the delight he evinced seemed to border on ecstacy.

Experience having shewn that imbeciles and idiots understand rhythm, advantage should be taken of it to promote their education; combined with music and gymnastics, the best results may be hoped for. We cannot in this work lay down a plan of education; our limits only permit us to give general principles that appear to us useful. If we reflect on the number of combinations comprised in the nine arabic signs, and how many variations can be made with the seven musical notes, it will be seen that means are not wanting to educate some idiots, when they are alive to music and rhythm, —when they are capable of following certain occupations.

Had the same means been employed for the blind as for the deaf and dumb, the blind would have remained in a state of eternal darkness. Let idiots receive a *special* education, let their propensities, wants, aptness, be made to enlighten them; and if they cannot be brought to spontaneous rationality, at least they can receive an automatic education, and contract good habits. Music and rhythm, will serve to regulate the acts of individuals anormally organized, and give them the order and harmony wanting. Have not musical instruments been made monitors, by means of which crowds of men are guided? Is it not to the sound of the

drum and of the trumpet, that soldiers are led to combat, and that their ardour is increased or diminished? No art, as well as music, can serve to establish a language, a means of communication by the aid of which a certain degree of education may be given to idiots, who apparently are the least susceptible of receiving it. It is not the same with the education of the weak in intellect as with children endowed with intelligence and intellectual gifts beyond the common order. While the aptness of precocious children must be moderated, advantage must be taken of the aptness of idiots. In precocious children aptness leads to superiority or madness; in idiots, aptness leads to an ordinary state.

Signs have been successfully employed in the education of the deaf and dumb, they may be equally so in the education of idiots. It has been advised to simulate events, to impress on the mind feelings of morality and virtue; simulated events may be created with a proper view of conveying ideas and feelings to the brain of imbeciles. Nothing, perhaps, may better serve to attain this end than travelling; change of scene brings every day new sensations, awakens the sensibility, and generally presents much interest: the beauties of nature, the mode of life of foreigners, the ignorance of the language, and the daily wants of life, may facilitate every kind of simulated events. Public feasts, military movements, leave a deep impression both

on the minds of children and imbeciles. The many trifling accidents that may occur in a journey, and which cause trouble and discomfort, may also serve to awaken the sensibility of children born with weak minds.

If the views we have here given do not appear generally applicable, they will at least be found partially so, and principally for the rich, born with inferior intellect. The rich have full power to employ all the means necessary to withdraw their children from the state of ignorance and imperfection in which they are placed by nature. Time, the first-rate masters, books, are at their command, and if well directed, may ensure success.

We cannot here detail the assistance to be derived from medicine; to obtain sensations we know that electricity and galvanism have been employed. We now resume our former statement, and assert that it is possible to give to some imbeciles and idiots an education which may enable them to mix with the world without being a disgrace to their families; we may develop the faculties of the brain, if not in a normal manner, at least to a degree far beyond a state of idiotcy. Music, rhythm, gymnastic, gests, example, may have great influence on them, particularly when their attention is attracted. Care should be taken to bring all the senses into play; and what Dr. Itard did for the young savage confided to his care, may

be done for idiots and imbeciles. Baths and shampooing may be employed to develop the sense of touch. Who can doubt the possibility of giving an education to the young girls who formed the subject of the two first cases? and yet what was done for them?—nothing; —not more for them than for Peter the Wild Boy; yet they were alive to music and rhythm. This road to education offers an ample harvest, and great success is reserved for the man who will have the patience and talent to track the arduous furrow that no one has traced before him.

CHAP. V.

Influence of the Mind on the Body.

In the chapter devoted to nervous constitutions, our study of children is confined to the age at which their intellectual education commences. We have treated convulsions, chorea, epilepsy, idiotcy. We returned to the subject of idiotcy, because it is prolonged during the whole period of life, unless we endeavour to improve this state as much as possible by means of the light furnished to us from a knowledge of the human organization, and the influence of physical agents on the development of the intelligence. It now remains for us to study a subject of equal importance,—the education of individuals in whom the nervous system is too highly developed, whether by nature, or forced by education. This study relates rather to girls than boys, for the defects of education are more common among the former than the latter.

Nature has endowed woman with a greater degree of delicacy and sensibility than man; and through an extraordinary error, which has existed nearly in all ages, the education of women, excepting perhaps those of Lacedemon, has always tended to the extreme development of this sensibility. This defect in education, originating in maternal affection, may be traced

as far back as the time of Moses, who said, "The tender and delicate woman among you, which would not adventure to set the sole of her foot upon the ground for delicateness and tenderness, her eye shall be evil toward the husband of her bosom, and toward her son, and toward her daughter." (Deut. xxviii. 56.) At Rome, Athens, and in the capital cities of both continents, the children of the opulent are brought up so as to increase the delicacy of their constitution, under the specious pretext of being made lady-like. Their organs are debilitated; their complexion becomes pale; their bodies thin; and their nerves so sensitive, that the slightest impressions induce nervous attacks. The effect of music on the organization is so powerful, that it even affects the brain of an idiot; music is the art most cultivated among women, and one of those which most powerfully contributes to enervate them.

Absence of muscular movement, of exercise, and action,—a sedentary life, novel reading, plays, false and ill-directed education; such are the means by the aid of which young girls are brought up, and the finest constitutions are depraved. It is so well known that modern education tends to sur-excite the nervous system, that every author who has treated of nervous diseases, whether general or local, has pointed out hysterical affections, so common to young ladies, as originating in bad education.

When either boys or girls shew a marked disposition for any particular calling, they require special education, even if this profession be suited to their social position and future happiness; but if their inclination tended to withdraw them from a quiet and happy domestic circle, to undergo the uncertainty and anguish attendant on certain professions, every method should be employed to damp the ardour so little calculated to lead to happiness.

Boys find in their various pursuits, objects to gratify their activity, and though in every situation in life this activity must be kept within bounds, it is always more unlimited than with females. A young man may be in the army, or navy, a lawyer, a merchant, or a traveller,—in each of these callings his activity may be regulated, while at the same time it increases. Man is naturally much less passive than woman; his activity reacts on all that surrounds him; he lives less alone, and his sensibility so often excited—is blunted, and loses from habit its primitive force. The case is widely different with females; as they do not embrace any particular profession, their activity is more confined, more concentrated, exercised in a more limited circle. The influence of natural events and physical causes has much more power over women than men. Education adds to these natural and social dispositions; all the occupations, talents, and arts of women confine them to their houses.

Delicate and affectionate by nature, their delicacy increases, and is continued by absence of exercise and sedentary occupations.

What is there in the upper circles of life to counterbalance these causes of debility and weakness? Nothing. Girls are kept confined to a drawing-room, while boys take exercise in the open air. From the earliest age the amusements of females tend to the perversion of taste; dolls are given to them, as though the chief occupation of woman was to adorn herself. Girls are taught music, drawing, and dancing, and they are made to acquire an imperfect knowledge of foreign languages, but they are seldom taught anything that is really useful: they are brought up without any regard to the future, as though history offered no example of political misfortunes, which have compelled noble hands to perform useful works. But above all, girls are made receptacles of sensibility, which too often vibrate. Weak, nervous beings, women are galvanized by the least shock; it is in fact forgotten, that they are destined to be wives and mothers, and therefore that the highest blessing they can possess is health.

When girls are born with dispositions too precocious, and have too much energy, their desires must be moderated, and any particular talent should only be developed, if it may tend to the good of the individual, as the chief end of all education should be happiness. A country life,

among the simple and beautiful scenes of nature, is best suited for girls of nervous temperament. Let them not frequent plays, nor read novels, which tend only to give false notions of life; but let religious principles be impressed on their minds; inculcate habits of industry that may be useful in the ulterior acts of life.

Woman is so strongly influenced by all that surrounds her that she owes much more to education than man, and her happiness will consequently depend on the direction received in early life. In bringing this work to a conclusion, we feel that much more could be said on a subject of such deep interest to every parent, but we have already exceeded our limits; and we shall now terminate by giving an example personally known to us, which may serve to elucidate the principles we have laid down in this chapter.

Julia.

Julia was born in Wales; she was the daughter of opulent parents, and spent her childhood among the romantic scenery of her native country. Until the age of seven she was left at full liberty, and had no instruction given to her. From her earliest age her precocity was extraordinary, which led her father to forbid books of any description. Her whole day was passed in the fields; she was strong, and fought with boys of her own age. Her head was beautifully formed;

fine black hair hung in ringlets on her shoulders, and her dark bright eyes were remarkably expressive. She shewed great independence of mind; a stranger to fear, she was known by the appellation of "the pretty bold girl," and was the queen of all juvenile parties.

Stories of ghosts had no effect on her; she was neither alarmed by mice nor spiders; she would handle any labouring tool with great dexterity, and was remarkable for her good health, strength, and courage.

Much alarm was one day spread among her companions, who were playing in the fields, by the sudden appearance of a serpent; some ran away; others, overpowered by fear, fainted. Julia climbed up a tree; but it suddenly occurred to her that the venomous reptile might injure some of her young friends; she quickly came down, and catching hold of a stick, struck the animal a blow that left it lifeless.

Julia learnt French and Italian from hearing it continually spoken by those around her. When seven years old, she commenced her intellectual education with the aid of books and masters, and gave herself up to study with so much ardour that she fell ill, and her recovery was long doubtful.

After this malady, her father had the good sense to restrain her ardour; she had a decided taste for music, rhythm, and poetry. From the age of nine to twelve she learnt drawing, dancing,

music, and foreign languages; but these different studies were judiciously interrupted by gymnastic exercises and frequent walks in the fields. Her father felt the necessity of creating for her occupations that would withdraw her from too intense study, and he endeavoured to render her walks interesting. Julia delighted in botany, and soon became acquainted with the Flora of Wales. It was impossible to see a child more docile, affectionate, and happy; the serenity of her mind was depicted on her fine countenance.

When Julia was twelve years old her parents came to reside in London; she regretted the romantic scenery of Wales; she could no longer run in the fields, and gather flowers in her walks. Her father having a government appointment in India, left his child in England under the care of her mother. Julia being no longer able to amuse herself in the open air, books and music became her favourite pursuits; but the colour on her cheeks faded; she grew pensive, and felt lonely; she would spend whole days at the piano-forte, and at other times was unable to touch a note. Her anxious mother observing this change in her child's disposition, thought she required amusement and diversion from her studies, and with this view she frequently took her to the Italian Opera.

Pasta and Malibran were then in the height of their glory. Julia was beyond measure delighted at what she saw and heard; her rapture knew no

bounds. The applause was so loud that the *prima donna* could scarcely proceed; the enthusiasm was general; every *brava! brava!* seemed to re-echo in the heart of Julia: she felt a general tremor, and tears flowed down her cheeks; she attempted to join in the applause, but the words expired on her lips!

The splendid scenery, the brilliant lights, the elegance of the dresses, the enthusiastic plaudits, but above all, that *prima donna* who received so much homage, left in the mind of Julia an indelible impression. On her return home she was in high spirits; she spent all her time at the pianoforte; she practised the music in *Otello*, and continually tried to sing the air, *assis' al pie d'un salice*, which had won so much homage for Desdemona.

Julia's mother thought she had found the means of diverting her child, and rousing her from the state of apathy in which she had fallen since her residence in London. Julia begged to have an Italian singing-master; the request was granted with delight; her mother was too happy to see her child once more take an interest in her studies; but Julia thought of nothing but music. She looked forward with impatience to the opera nights—identified herself with the *prima donna*, and probably felt more than the *actrice* herself; in short, Julia was never happy but when at the opera, and her fond parent unknowingly contributed to administer to her child a deadly poison.

She listened to all her desires, and sought the means of their gratification; she became acquainted with the opera singers, and invited them to her house. Julia envied them a profession which seemed to afford such intense happiness, and her passion for music increased. On her return from the opera, she would spend half the night endeavouring to repeat the passages that were most applauded; she tried to imitate the *actrice* so universally admired, and called her only *Diva*—a name given by the Italians to the divinities of the stage. Julia at length made known to her mother, that the object of her ambition was to go on the stage, and that all her happiness was centered in this circle.

The injudicious mother now felt how much she had erred; she was left without resource, she had no will of her own, had never yet contradicted her ill-fated child, and knowing her resolute mind, saw at once that all opposition was useless. She sought relief, by communicating to her husband the subject of her sorrow, but much time elapsed ere a letter could reach him, and the afflicted mother saw no means of combating her daughter's inclinations. When the father received the sad intelligence, he resigned his appointment, and returned home; but instead of treating his daughter with his usual indulgence, he brought his paternal authority into action. He forbade music of every description, had the piano-forte taken away,

closed his doors to musicians, and called his daughter mad. Julia submitted in sorrow, to her father's will. Four years absence had weakened the ties of filial tenderness; he was no longer the affectionate, but the injured parent; while his child now looked on him rather as a tyrant than a friend: both father and daughter were unhappy.

The sudden change in Julia's habits, the little compensation she found for all the emotions she had been harshly compelled to relinquish, and in which she had so long indulged, affected her health; she again became pale and thin; a slow fever consumed her, and she was so weak, that she could scarcely walk; she suffered from giddiness, and palpitations of the heart. Some physicians thought her consumptive, but, in our opinion, she afforded a striking example of the effect of the mind on the body.

At last, a fearful illness came on. which was followed by brain fever; in her delirium, she sung the most beautiful passages,—she imitated Malibran, and while in bed, dressed herself for the stage with whatever she could obtain.

How lamentable was it then, to see the father watching over his ill-fated daughter!—a prey to the most acute anguish, and vainly seeking relief in tears—a woman's consolation, in which the mother found her only solace. The invalid had suffered more than a month, and was not yet considered out of

danger. The sentiment of family pride, and dignity were now at variance with parental love; and the father reproached himself with having been too severe, too inflexible.

At length a physician, who did not believe that all the resources of art were confined to an apothecary's shop, was consulted, and being made acquainted with the unhappy circumstances, advised the parents to allow the daughter to think that after her recovery her inclinations should not be opposed: he named several *actrices* of high repute, who had ennobled their career by virtuous conduct;—he shewed that the profession was only sullied, as indeed are all others, by gradations of character and conduct, yet that circumstance does not debar honourable minds from the pursuit; and he ended, by appealing to parental feeling, whether it was not better that the daughter should be honoured and admired as *prima donna*, than become an inmate of a lunatic asylum, or be brought to a premature grave.

The father, at last, believing it possible that his daughter might indulge her infatuation, without becoming a prey to the contamination he had considered inseparable from the pursuit, left the physician to employ the result, for the benefit of the patient. The conversation between the physician and the young sufferer, at length, turned upon the subject of the stage. Since her father's return, and the entire rejection of all that recalled her happiest moments, she had

never mentioned the theatre, or pronounced a word of Italian. The physician, who had travelled much in his youth, and was fond of conversing in this language, soon discovered that it pleased the invalid,—"I love Italian," said she, "its accent is so sweet; I had once thought I might have been *prima donna;* I was too soon recalled from my too happy dream. I have now before me but the dull realities of life: what a sad change from the bright illusion I had formed! But I must learn to submit to my father's will, and try to live, though death to me seems far sweeter than an existence like mine."

The physician took great pains to convince the sufferer that her father only desired her happines. "Happiness," said she, drawing from her bed an almost withered arm, "is it in such a state as this, that a girl of eighteen can be happy?" The following day, the patient seemed to have more confidence in her physician; she said she had slept well, and dreamt she was playing Desdemona; she appeared better; there was evidently, a great change in her ideas. The Doctor intimated, that if she recovered her health, her father *might be* induced to allow her to follow her desires. The effect of this communication on her mind, was more favourable than could have been expected; her disease seemed suddenly arrested; her strength gradually returned; she was soon able to leave her room,

and was ordered to the country, for a change of air.

Julia's father, who had reproached himself for being too severe, felt his sorrows greatly alleviated; the mother, who had not ceased to bestow on her sick child all the tenderness of which the female heart is capable, began to sink under fatigue and anxiety, and a change of scene and air was also requisite for her re-establishment.

A neat cottage was taken near Hampstead, and in Julia's room was a piano-forte. What was her delight in seeing a musical instrument, and finding near it the best productions of Mozart, Rossini, Donnezitti, and Bellini! The unhappy father had seen his child so near the tomb, that he did not feel justified in offering any obstacle to her future wishes; his former severity could only be equalled by his present indulgence.

The Doctor ceased his morning attendance, but paid evening visits to his interesting patient, whom he always found at the instrument; he sung some Italian duets with her; happiness and contentment appeared once more to be her lot. There was no longer cause to fear for her life, but she recovered very slowly; she was thin, her voice was weak, and she could not sing long; the least exertion was too much for her, she fainted often, and complained of general debility. "You are very kind," said she to her physician, "in having

obtained my father's consent to my going on the stage, but it has been granted too late,—I feel I cannot live long; it is a last concession granted to the dying, and I fear it will avail me but little." Julia, however, slowly recovered her strength, and was then able to enter into society. The physician, who took the greatest interest in his patient, told her parents that nothing would tend more to benefit their child than returning to Wales: he thought the scenery she so loved in her early age would refresh her mind and give a new direction to her ideas; and he assured the young lady that some time must elapse ere she could appear before the public. Unfortunately his advice was unheeded; she afterwards went on the continent with her family, with the understanding, that she was to be allowed to pursue the career she had chosen.

Two years after she left England, she was about to make her appearance on the boards, at the theatre *San Carlos;* but this young girl, so strong, so courageous, so lively, had been so enervated by illness, and still more by the excitement, so common in the theatrical career, that she was scarcely able to fulfil her engagement. "I do not know," wrote she to a friend, "how to account for my present feelings, but I am not sure of myself, my nerves are so agitated, that the least noise alarms me. I am to appear before the public in a few days, and this moment I so ardently wished for, I now look

forward to with dread, and fear that when the time comes, my courage will fail me: if one single murmur were uttered, I should fall lifeless."—"Pity me, pity me," said she, "I dread the fate of Prometheus;—like him, I wished to rob the celestial fire, and this fire, so indispensable on the boards of a public theatre,—this fire, which should animate and support, burns and consumes me:—I do not feel as though I could depend on myself, my knees bend under me, my mouth is parched, and my voice uncertain."

The night preceding Julia's first appearance, she could not sleep; she vainly sought to calm her agitated mind. The day was spent in preparation, but when evening came, Julia could scarcely support herself. The overture finished, and she was to make her entrance, but she stood motionless, behind the scenes; she was pushed on the stage; she rallied, and began her recitation, and though it seemed to her as if her voice was not firm, yet was she applauded, which gave her courage, and the effect she produced was marvellous. But one of the stage boxes was filled with young men, partizans of the *actrice*, whose place was to be taken by Julia; their loud laughter and hissing, so alarmed her, that her throat became dry, her tongue was motionless, and a complete failure must have been the inevitable result, but for the chorus.

The third act commenced by a mad scene,

in which Julia's acting was sublime; her voice was clear and full, and as her animation increased, she electrified the audience by her impassioned description of the wrongs of an injured and innocent wife. The house rung with applause, and no doubt could exist, as to the rank she was henceforth to hold in the theatrical world: she had attained the object of her anxious wishes, and looked gratefully on those who contributed to fill her cup of happiness: she curtsied gracefully, and waved her hand; when suddenly loud hisses were heard from the party in the stage box, and these hisses were re-echoed from the opposite side of the house. Unprepared for this shock, she stood motionless: she was performing the part of a mad woman; she looked wild indeed! The hisses lasting, she uttered a piercing shriek, and rushed behind the scenes. This cry of despair, caused instantaneous silence, and the lovely actress was loudly called for; but those powers which had been thought so wonderful, and produced so magic an effect, no longer existed. Julia's reason had fled,—she was a maniac.

Her parents bestowed on her the most affectionate care, but she knew them not: they withdrew to the country, to seek in retirement, the consolation that the world would have refused them.—It was announced, in the public papers, that Julia had undertaken a part she was unable

to perform, and that she had no talent for a *prima donna.*

This story offers a very useful lesson to observing minds. Tranquil and happy, while she lived far from the dangerous excitement of large towns, this girl contracted the taste and habits of those persons whom the mother had unwisely admitted into her domestic circle, and this taste was indulged till it became a passion, which, at one time, nearly brought her to an untimely grave, and finally, bereft her of her senses.

This state of enervation is not common to artists alone,—it is but too frequently seen in high life. Girls are brought up in indolence and luxury,—the nights spent at balls and routs,—the mornings in warm bed rooms; perfumes and cosmetics constantly used: it naturally follows, that women must be weak and delicate. It is speaking of them, that the poet ironically but justly said,

"Die of a rose in aromatic pain"

If we add to this enervating mode of life, high living, or, what is still worse, inaction of the body, while the mind is employed in novel-reading, it will then be easy to account for the many nervous diseases so frequent in large towns. If a young lady, nervously affected, and subject to hysteria, be sent into the country, and her mind steadily occupied, simple tastes encouraged,

studies well directed, cold baths, early walks taken, the predisposition to nervous diseases, which embitters the existence, would not long exist, and the fine ladies of the present age, would then be enabled to fulfil their duties as wives, and mothers.—Tasso's Hermione sought peace of mind with the pastor, who had learnt from experience, the deceptions of this life.

Nothing is so well calculated to afford fresh vigour to the exhausted mind, as the picture of a country life; the simplicity of villagers, their wants, their enjoyments, all tend to give the mind a new direction.

The powerful influence of the mind on the body is incontestible; the roughest and most credulous men talk of the effects of the imagination; and its power over young girls cannot be doubted. Examples of the effects of imagination, produced by the love of arts, are very rare; but how numerous are the victims to the passion of love!—To how many might be applied the beautiful lines of Shakspeare!—

> "She never told her love,
> But let concealment, like a worm in the bud,
> Prey on her damask cheek."

Strong passions have great influence on the organization. In physical education, it is necessary to have studied all the wants and sensations of young people; the great art is not to attempt

to suppress them—for that is impossible, but to endeavour to direct them. There is not a want, not a faculty, that is useless to man; we must not then as a modern Procrustes, strive to curtail them. Man is, of all beings, the most modified by external agents; he receives an accidental physical and moral education from all that surrounds him; and it is because an education of chance has so much influence on the body and mind of youth, that we should endeavour to give a good premeditated education, that will regulate bodily and mental development, and early prepare the road that leads to health, beauty, and happiness.

H K. Causton, Printer, Birchin Lane.

CRITICAL OPINIONS

ON

DR. BUREAUD RIOFREY'S WORKS.

PHYSICAL EDUCATION.

(first Edition—in French.)

The present Work may be looked upon as a rarity in scientific literature. Occasionally, indeed, ome authors have given a chapter or two containing remarks on the physical education of the sexes, nore especially at an early period anterior to puberty; but the ideas therein eliminated are in ge- ieral so crude and undigested, as to afford but little information—but little real instruction to their eaders. Dr. Bureaud-Riofrey's work, on the contrary, is a monography specially devoted to the ubject he treats of, in the investigation of which he has long been engaged, and consequently we ave reason to expect that the book will well repay us for the time spent in its perusal.

A work on physical education should be written for the information of mothers, as it but seldom iappens that medical men can or do take young females sufficiently under their care to superintend hem during their advance to puberty; a most interesting period of their lives, and one fraught vith danger from a thousand causes, and which are increased a million-fold by the conduct at present pursued in rearing them. To point out these rocks and shoals, on which the health of nany a young female has been wrecked, is the object of the present work, at the same time indi- cating in what manner they are to be avoided. Dr. Bureaud Riofrey has accomplished his task in a complete and excellent manner. The work is exceedingly well written, and one of the most in- teresting which we have perused for some time."—London Medical and Surgical Journal.

This is a work of considerable merit, and is pre-eminently entitled to the attention and gratitude of the ladies, to whose physical education and development it is especially consecrated. Their health and comfort through life are the benevolent objects which the learned author has in view: and for this purpose he appears to have hung over their cradles, and to have followed them step by step, from infancy to womanhood with manly tenderness and parental solicitude. His multi- farious reflections are, in general, just and rational, the evident results of an enlightened theory, confirmed by steady observation and extensive practice We can with confidence offer it to the attentive perusal of every intelligent mother, who will find in our author a pleasing companion, an eloquent monitor, and a safe guide. No governess (in our opinion) should be entrusted with the sacred duty of female education, who had not made herself mistress of its principal contents.— Sun.

It is an important feature in this work, and one that renders it peculiarly eligible to its object, that, though it necessarily embraces topics of sacred delicacy in their nature, yet it may be read by mothers and daughters without hesitation, as it does not contain a word to offend the most fastidious ear or sentiment. We should be, therefore, glad to see it translated, for the benefit of those unacquainted with the French language, as many common errors, in regard to unscientific systems of Gymnastics, are exposed, and principles are laid down, which, if generally adopted, would tend much to prevent the distortions which at present afflict so many of our countrywomen, and cherish, to the perfection of beautiful maturity—woman, the most treasured gift that man has received from his Creator.—Morning Paper.

Sous ce titre: Education physique des jeunes filles, ou Hygiène de la femme avant le mariage, M. Bureaud-Riofrey, médecin français à Londres, vient de publier un livre qui se recommande à la fois comme œuvre scientifique et comme œuvre litteraire. Les hommes de l'art y trouveront des aperçus neufs et ingenieux; les gens du monde une lecture attrayante et d'utiles directions pour aider au developpement des forces, de la grâce et de la beauté de leurs filles. L'auteur en effet embrasse, ce triple objet dans son ouvrage. Nous signalerons plus particulièrement les chapitres dans lesquels il traite de la femme et de ses différens âges; de l'influence des agens physiques sur la vie; de la constitution et des tempéramens; des constitutions héréditaires et des constitutions acquises; des déviations et déformations; de l'accroissement; de l'importance de l'education physique; de la gymnastique générale, des la gymnastique médicale, et de la gymnas- tique des sens et de la voix; de la methode curative; du repos; du sommeil; de la puberté; etc.

Ce livre est le produit des observations et de l'expérience de M. Bureaud-Riofrey, dans l'exercise consciencieux et éclairé de sa profession; il nous semble appelé à obtenir un trés grand succés.— Journal de Paris.

Education Physique des Jeunes filles, by Dr. Bureaud Riofrey, is a volume instructing Young Ladies on proper air, exercise, diet, &c. and written in that style of gallant fervor which distin- guishes the French from the colder English style in such elementary treatises. An English p of fourteen, would hardly know herself as described by our learned but not unimaginative Au p. 20. "Naguère encore tout lui était cher: elle était heureuse d'une fleur, de la moindr rure; et tout-à-coup ses goûts changent, ses jeux ne peuvent plus la distraire; elle est in et rêveuse, son attention ne peut se fixer: elle s'étonne elle-même des inégalités qui la mentent."—London Literary Gazette.

L'influence des agens physiques sur la vie, et spécialement sur celle de l'enfant, est trop puissante, l'expose continuellement à trop de dangers si elle est mal dirigée, pour que le médicin hygiéniste néglige de tirer parti des immenses progrés faits depuis quelques années par les sciences physiques. Quelques considérations générales sur ce point, un petit nombre de citations empruntées aux ouvrages de MM. Edwards, de Humboldt et de quelques autres naturalistes, et surtout de nombreuses applications à l'éducation des jeunes filles, donnent aux premières pages de M. Bureaud un intérêt que l'on rencontre rarement dans les ouvrages de ce genre. Des recherches sur le solidarité et le balancement des organes et des fonctions, sur les constitutions et les tempéramens, sur les constitutions hereditaires et les constitutions acquises, forment autant de chapitres que l'on parcourra avec plaisir et profit. Celui sur l'accroissement, surtout, nous a paru mériter une attention speciale. C'est durant l'accroissement que se prepare l'existence tout entière; aussi M. Bureaud a-t-il eu raison de dire que "l'accroissement gouverne toute la vie." Nous voudrions reproduire ici les considerations generales qu'il emprunte a l'etude des divers règnes de la nature, et les inductions importantes qu'il en tire, pour établir la necessite de surveiller l'accroissement des jeunes filles, de diriger leur developpement pendant cette époque de nt toute empreinte bonne ou mauvaise reste on pourrait dire ineffaçable; mais ce chapitre demande à être lu dans l'ouvrage, et des citations ne le feraient connaitre que très-imparfaitement.

Lorsqu'on commença a employer dans les temps modernes la gymnastique dans l'education des jeunes gens, en exagera trop, non-seulement les resultats que l'on en attendait, mais encore les exercices auxquels on soumettait la jeunesse. Nous condamnons avec l'auteur, dans l'education des femmes, tous ces exercices gymnastiques qui n'ont d'autre but que developper les forces musculaires. Nous ne pouvons trop recommand a la lecture de son chapitre sur "la gymnastique" aux mères qui elèvent leurs demoiselles sous leurs yeux et aux maitresses de pension; elles y trouveront a la fois d'excellens principes sur la gymnastique en general et de bonnes directions sur les divers exercices qui peuvent le plus contribuer a developper la grace et la beaute de formes chez les jeunes filles, et contrebalancer les effets d'une fâcheuse habitude ou d'une organisation vicieuse.

Avant de terminer cette courte notice et pour resumer en peu de mots l'impression que nous a laissee la lecture attentive du travail de M. Bureaud, nous dirons qu'il nous a offert, reunies a la clarte et a l'elegance du style convenable pour un tel sujet, une erudition choisie et toutes les connaissances positives d'un ouvrage scientifique, en même temps que nous n'y avons point rencontre de ces lieux-communs que l'on croit ordinairement avoir le droit de laisser passer dans les ouvrages sur l'hygiène. Gazette Medicale de Paris.

Though the matter of which this excellent volume treats, is somewhat out of our province, still the subject is of such high importance, that we feel bound to call public attention to Dr. B's, excellent work.

The mode of rearing young and delicate females, so as to render them healthy mothers of families has long required the investigation of men of Science. How often have we seen the external rearing of girls entrusted to an ignorant soubrette, sometimes even to a drill sergeant, whose gymnastics improperly applied, have produced the very diseases which they where to have prevented. Dr. Bureaud Riofrey has handled his subject in a lucid and highly scientific manner—such a work has long been wanted—none could have executed it more ably. We beg earnestly to recommend it, not only to the medical faculty, but to mothers of families, who will find no difficulty in comprehending it, and whom it will enable to guard against many casualties with which from improper treatment young females are often afflicted —Court Magazine, August, 1835.

That Education in general is defective in this country, is a truth which cannot too often be repeated, or placed in its several points of view. Mons. Bureaud Riofrey has, then, been happy in the choice of his subject; the theme is of the utmost importance to society, and strange to say, it is almost virgin and untouched.

In drawing attention to the many pernicious influences to which girls are exposed in the course of what is so improperly called their education, and in endeavouring to give to parents a knowledge of some of the laws which regulate the development of the female constitution, during the periods of its growth and adolescence, Mons. Bureaud Riofrey has assuredly done good service to the state.—Athenæum, 10th October, 1835.

Although it is not our habit, to notice Medical Works, we have been so much struck with the great utility of the contents of this book, published in French, that we think it right to speak of it in the terms which it merits, especially as it is not to be considered exclusively a Medical work. The subject of it, viz: the physical management of young females, with a view to the security of their health in riper years, is one which has not been before treated of by any writer of eminence, and has, in this instance, been managed with a degree of delicacy, technical ability, and good judgment, which reflects the greatest honor on the Author. Its details are so important, and so interesting to mothers, and to all entrusted with the care and Education of Young Females, that we recommend it strongly to their notice, and we hope that it will not be long before a work capable of being so beneficial to the community, will be translated into English and other languages."—Sun, Evening Paper.

"Though addressed to the faculty, it is written for mothers; and the language, though popular, [illegible] utmost purity, clothing with unobjectionable expression, ingenious thoughts on subjects [illegible]te as they are important. Even in a chapter on corsets there is a union of scientific [illegible]ge, and refined taste, of good feeling, and right thinking, which recommends the [illegible] the reader's sympathies, and the book to his attention.

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